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AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

CUTTING WITH GAS
Manufactured or Natural

is an accepted process in some of the world's largest industries, notably, the General Electric Company, in some of its heaviest, continuous and most accurate operations; in the Ford Motor Company, especially in the largest scrapping job ever accomplished; the Standard Oil Company in the natural gas field.

The Milburn Company specializes upon the manufacture of cutting torches irrespective of the kind of combustible gas used.

The World's Simplest Gas Booster
(Quoting A. G. J.)

Designed by:
The Barber Asphalt Co.
Sole Distributors:
The Alexander Milburn Co.
and
Milburn Paint Spray Corp.

Manufacturers of the World's Best Welding and Cutting Equipment

THE ALEXANDER MILBURN CO.
Established 1907
1416-1428 West Baltimore Street
Baltimore, Md.

IN TWO PARTS—PART 1

Phenol Removal
from
Coke Plant Wastes

THE problem of phenol removal need no longer vex operators of by-product coke and gas plants. The old steel-corroding, coke-deteriorating method of using phenol bearing wastes to quench coke is no longer necessary.

The Koppers Construction Company announces a perfected process to strip phenol from coke plant wastes. The process has been carried through laboratory and plant size tests by The Koppers Company and is now in actual successful operation at the coke plant of the Hamilton Coke and Iron Company at Hamilton, Ohio.

Through the courtesy of the Hamilton Coke and Iron Company, we invite ... visitors to inspect this plant ...

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago **Pittsburgh** **New York**

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
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Executive and Editorial Offices, 53 Park Place, New York City

S. G. KRAKE, *President and Treasurer* A. M. GLEASON, *Secretary*

H. M. RILEY, *Editor*

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Vol. 130, No. 1 **January, 1929** Whole Number 3661

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F. P. CURLEY, *Service Department*, 53 Park Place, New York.
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Built for
The Nassau & Suffolk Lighting Co.
Long Beach, Long Island

78 Years of Service to the Gas Industry

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NEW YORK OFFICE
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This purifier tray, made without any metal fastenings, was devised under operating conditions by a practical gas man who knew from experience what sulphur does to bolts and screws.

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The gas industry is indebted to F. C. Wellington, the inventor, for his practical and complete elimination of an operating problem that has confronted gas men almost from the beginning of the industry.

We have secured the exclusive right for the manufacture, sale and distribution of this tray under the pending patent. ***We will be glad to ship you a sample tray to test on your own plant.***

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ENGINEERING CORPORATION
Division Allied Chemical and Dye Corp.
40 RECTOR ST. NEW YORK

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Atlantic City Gas Co., Atlantic City, N. J., operated by The C. H. Geist Co. Installation 9 ft. x 30 ft. Smoot Steam Accumulator. The U. G. I. Contracting Co., Engineers.

28-4

Hudson Valley Coke & Products Co., Troy, N. Y., installation of 9 ft. x 30 ft. Smoot Steam Accumulator. Semet-Solvay Engineering Corp., Engineers.

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Smoot Steam Accumulators equipped with Smoot Control are installed in the gas plants of forty-two cities in nineteen states of the United States.

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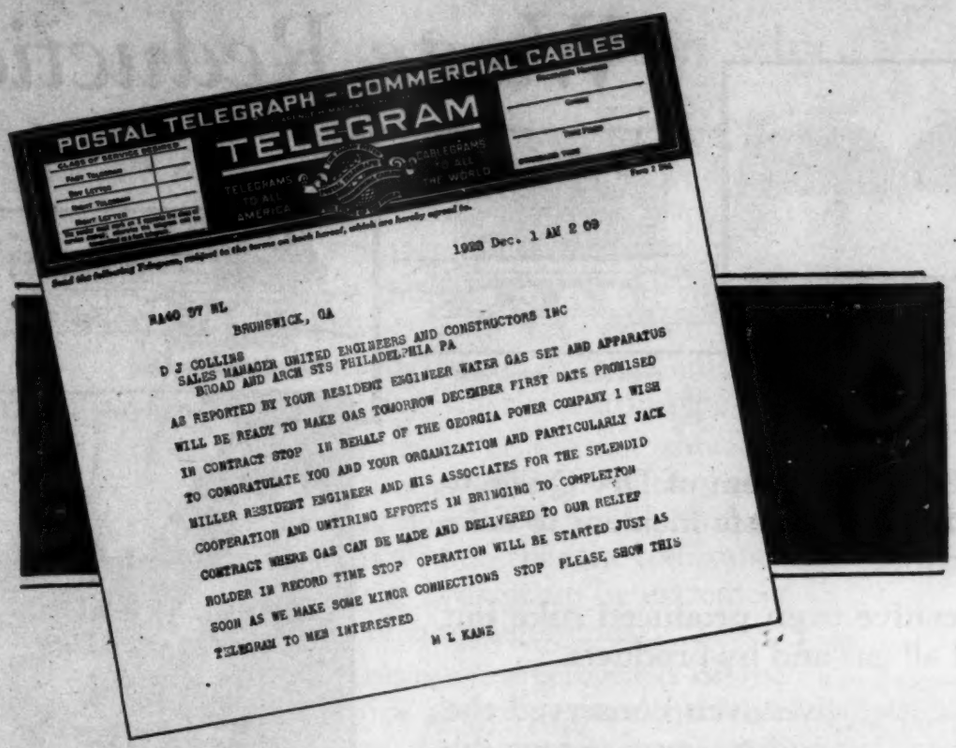
136 Liberty Street New York

SMOOT CONTROL

. . . IN RECORD TIME



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SALES MANAGER UNITED ENGINEERS AND CONSTRUCTORS INC
BROAD AND ARCH STS PHILADELPHIA PA

AS REPORTED BY YOUR RESIDENT ENGINEER WATER GAS SET AND APPARATUS WILL BE READY TO MAKE GAS TOMORROW DECEMBER FIRST DATE PROMISED IN CONTRACT STOP IN BEHALF OF THE GEORGIA POWER COMPANY I WISH TO CONGRATULATE YOU AND YOUR ORGANIZATION AND PARTICULARLY JACK MILLER RESIDENT ENGINEER AND HIS ASSOCIATES FOR THE SPLENDID COOPERATION AND UNTIRING EFFORTS IN BRINGING TO COMPLETION CONTRACT WHERE GAS CAN BE MADE AND DELIVERED TO OUR RELIEF HOLDER IN RECORD TIME STOP OPERATION WILL BE STARTED JUST AS SOON AS WE MAKE SOME MINOR CONNECTIONS STOP PLEASE SHOW THIS TELEGRAM TO MEN INTERESTED

M L KANE

The installation referred to is a six-foot U. G. I. carburetted water gas apparatus complete, including Chrisman Cycle, blowing plant, fuel hoist, U. G. I. high duty condenser and immersion washer. Built in 30 days from date of contract to date of completion.

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U. G. I. service—like U. G. I. equipment—may be depended upon to meet every emergency.

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THE U. G. I. CONTRACTING COMPANY

DIVISION OF

UNITED ENGINEERS & CONSTRUCTORS

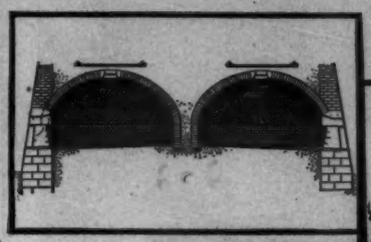
INCORPORATED

DWIGHT P. ROBINSON, PRESIDENT

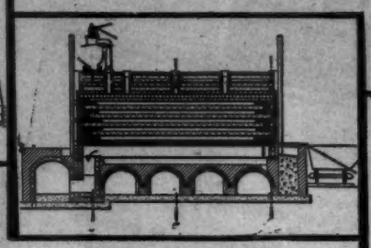
Principal Office — Philadelphia

CHICAGO ATLANTA

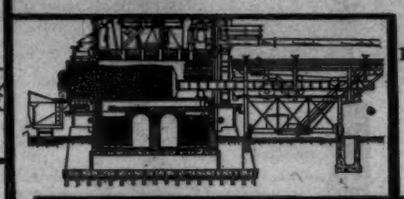
A further step toward Waste Reduction



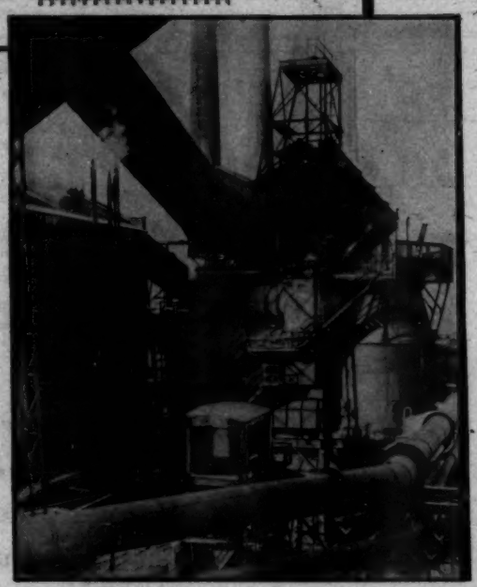
BEEHIVE OVENS



RECUPERATIVE OVEN



REGENERATIVE OVEN



THE Sulzer System of Dry Quenching reduces the waste incident to coke production.

The beehive oven produced coke but wasted all gas and by-products.

The recuperative oven conserved the ammonia, tar and to some extent the oils and coal gas.

The regenerative oven reduced the waste incident to high waste gas temperatures.

A thousand pounds of high pressure steam is delivered per ton of coke cooled by the Sulzer Dry Quenching System—from heat formerly wasted by wet quenching.

The steam production is secured from heat that is entirely wasted by all other methods. It is a further step toward waste reduction.

THE Sulzer System for Quenching coke is simple and dependable. Literature describing this system will be sent to those interested in the advantages of Dry Quenching.

Dry Quenching Equipment Corporation

INTERNATIONAL COMBUSTION BUILDING

200 MADISON AVE. NEW YORK N.Y.

A SUBSIDIARY OF INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

deLavaud is 25% stronger

than any other CAST IRON PIPE

and . . . here's the reason why

IT has long been known by chemists and engineers that the finer and less angular the graphite particles of any cast iron, the stronger will be the metal itself.

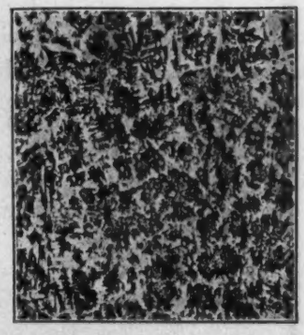
A direct comparison of the micrographs shown here will explain very clearly why deLavaud is mechanically superior to any other cast iron pipe.

The illustration at the left shows a cross-section of a piece of ordinary cast iron pipe magnified 100 times. Upon close examination we find that the continuity of the mass is broken up by extremely long flakes of coarse graphite.

Now observe the micrograph of the deLavaud Pipe shown at the right. Note the smallness of the graphite masses and the fine even texture of the metal. This density and the uniformity of grain structure give deLavaud pipe a tensile strength of more than 30,000 lbs. per square inch.

Indeed, exhaustive laboratory and factory tests have proved that deLavaud Cast Iron Pipe is 25% stronger than pipe cast by any other method.

Sand Cast Pipe. Micrograph showing center of wall cross-section. Magnification 100 times. Note the long flakes of brittle graphite.



Cross-Section of deLavaud Pipe at center of wall. Magnification 100 times. Observe the even grain and the finely divided condition of the graphite.

deLAVAUD CAST IRON PIPE

centrifugally cast by

United States Cast Iron Pipe and Foundry Company

General Offices:

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Los Angeles: 403 So. Hill St.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
Seattle: 1st & Marion Sts.
Minneapolis: 6th Street & Hennepin Avenue

To All Members of the Gas Industry!

ON THE THRESHOLD of a new year, we can look back upon an exceedingly busy twelvemonth, due to many new developments in design of our apparatus—which have met with the approval of the gas fraternity—and to a rearrangement of our shop organization and field forces, which have enabled us to facilitate our production to a marked degree.

The year just passed has been exceptionally kind in bringing us into contact with many new friends in the industry and cementing more firmly the friendship of our old acquaintances.

To all these we owe a debt of gratitude and we thank them for their hearty cooperation, which contributed in so large a measure to the success of Nineteen Twenty-Eight.

We look forward to an even greater year just ahead and trust our many new and old friends can also vision as equally a bright future, and when at the waning of the year we have entered upon, that their hopes will all be realized to the fullest extent.

To that end we hereby extend our sincere and heartfelt wishes for

A Happy and Prosperous New Year.

THE GAS MACHINERY COMPANY

1900 EUCLID AVENUE — CLEVELAND, OHIO

New England Office, 185 Devonshire St., Boston, Mass. Edwin E. Witherby, Repr.

The World's Largest Gas Holder — *and Connersville Boosters*

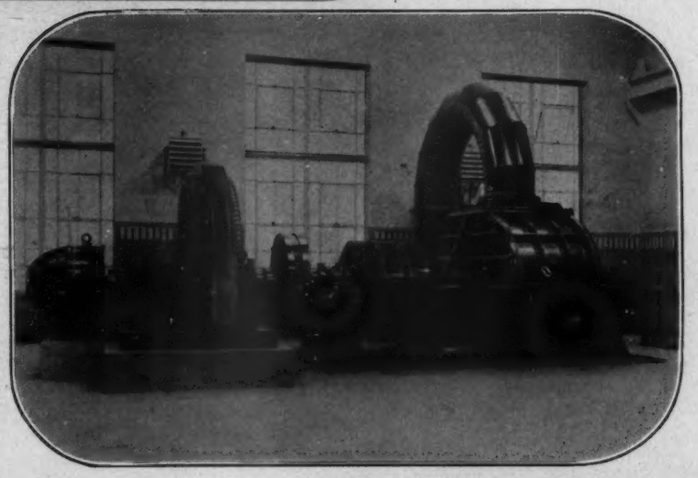
We are proud to be identified with this collossal 20 million cubic foot waterless holder recently completed for The Peoples Gas Light & Coke Company, Chicago, Ill., at their 73rd Street station.

Adjoining the site of this mammoth is a booster station housing two 500 H.P. Connersville High Pressure Pumps, with an hourly capacity of 750,000 cubic feet; or a 24 hour potential distribution capacity of 36,000,000 cubic feet. One of these pumps is driven by a gas engine; the other by a direct-connected synchronous motor.

A pumping station containing Connersville equipment of equal size, adjoins the company's 15 million cubic feet waterless holder in another section of the city.

The simplicity, ruggedness, accessibility, dependability and low cost of operation, which characterize all Connersville Gas Apparatus, and which was so ably demonstrated in the older station, were contributing factors in choosing the equipment for the new booster station, and is also the reason why many users, large and small, reorder Connersville equipment, without competitive quotations.

Write for Catalog 22; or consult our nearest office.



Top view shows Gas Engine driven unit

Center shows motor driven unit in the new Booster Station.

Lower view shows a duplicate Booster installation at the North Shore Station.

THE CONNERSVILLE BLOWER COMPANY

12th Street and Columbia Avenue, Connersville, Indiana

Sales Offices

Chicago — Pittsburgh — Boston — New York

CONNERSVILLE

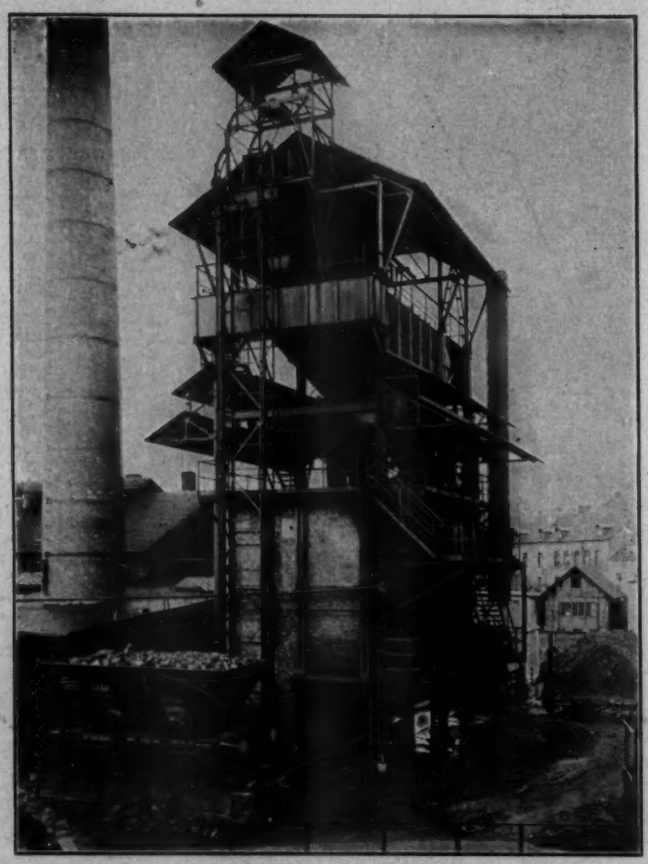
Blowers • Gas Pumps • Meters • Cycloidal Pumps

"INDUGAS"

VERTICAL CHAMBER OVENS

With Water-sealed Drop Door

INTERMITTENT TYPE



Minimum Labor
Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

City	Time	Yield cu. ft. per net ton	Heating value B.t.u. (gross)
Baden, Switzerland	4 years average	14075	560
Olten, Switzerland	2 " "	13317	570
Friedrichshafen, Germany	4 " "	16045	515

There's a Reason

Full information, layouts and estimates gladly furnished

CARL STILL CORPORATION

114 LIBERTY STREET, NEW YORK

STURDY
CONSTRUCTION PAYS

1,500,000 cu. ft. Holder erected at Norwalk, Conn.

INTEGRITY
FAIR C-K CO DEALING
SERVICE

CRUSE-KEMPER CO.
AMBLER, PA.
ENGINEERS & CONTRACTORS
BUILDERS OF STURDY GAS HOLDERS
PURIFIERS, SCRUBBERS, CONDENSERS, TANKS, ETC.

Over half a century ago "Lux" Oxide made its initial appearance. The basic principle of "Lux" being absolutely correct, there was no improvement that could be made that would better its purifying qualities. "Lux" today is the same as it was fifty years ago and is guaranteed always uniform. You cannot ask a better reason for specifying it for your purifying boxes.

Lux has the highest Ferric Oxide as Fe_2O_3, among precipitated Oxides averaging on a dry basis 52 to 57%.

Inerts in Lux are lowest. Lime (as CaO) no more than required 3 to 3½%.

Lux Material

BEST GAS PURIFIER

THE ALPHA-LUX CO., INC., 192 FRONT ST., N.Y.

"Lux-Sponge" —is unsurpassed as a ready-mixed oxide that gives greatest satisfaction in Water or Coal Gas Purification, because made of carefully selected coarse shavings thoroughly impregnated with the famous Lux Material, by special machinery.

Prompt Shipments, Carloads or less.

"LUXIT H. T." Cement (Dry)

For Patching Hot Retorts, Refractory Linings, etc. Shipped in 110 lb. bags.

Order Sample Shipment Today!

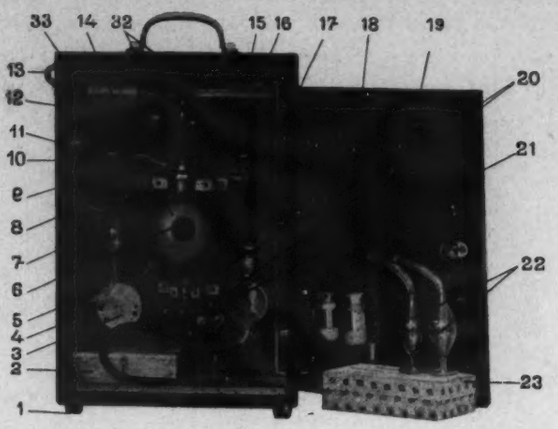
THE ALPHA—

192 FRONT STREET

HAND CALORIMETER

Dr. Strache-Kling (Loeffler Model)

For Determining the Heating Value of Gases



1. It is portable (weight under 10 lbs.)
2. It is accurate.
3. It requires only small quantities of gas for each determination.
4. It requires no water connection.
5. A determination can be made in one minute.
6. It can be operated by anybody without special training.
7. It does not require standardizing by H_2+O gas.
8. Its cost is reasonable.

The principle involved is the burning of an air gas mixture, of a known quantity of gas with a definite volume of air, in an explosion pipette insulated by means of a Dewar Vacuum jacket.

The temperature rise is recorded on an inserted thermometer. Each instrument is equipped with a computer table.

DR. OTT-LUX-GAS TESTER

For Indicating Change in Gravity of Gas, also in Heating Value of Gas

Dr. Ott - Lux - Gas - Tester is most simple in construction and operation. It combines in one operation the information usually obtained by three distinct time absorbing manipulations, namely, the **Gas Analysis, Specific Gravity determination** and **Calorimeter test.** While it is true that it cannot replace any of the three tests, where specific results are required, it is equally true that it will show any changes in the gas, which are caused by **changes in composition, gravity** or **heating value.**

LUX-RECORDING GAUGE

For Specific Gravity of Gas

(Simmance and Abady System)

To determine the Specific Gravity of manufactured gas is, today, as essential to the smooth running of a gas plant, as the determination of pressures and heating values.

In the Simmance Abady System-Lux-Recording Specific Gravity balance, we have an instrument which will give us, at a glance, not only any changes that may have occurred at any time, but furnishes a permanent record of the Specific Gravity of the gas throughout the 24 hours of the day.

LUX COMPANY INC.

NEW YORK CITY, N. Y.

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

FAST AND SURE

Real and rapid progress is made in laying pipe when every length of pipe is uniformly round and straight. ¶ That is the history of laying SMITH*Welded* pipe. Alignment, stabbing, and laying are fast and sure.

SMITH *WELDED* GAS LINE PIPE

A. O. SMITH CORPORATION, *General Offices: Milwaukee, Wis.*

OIL AND GAS FIELD PRODUCTS DIVISION

District Offices at New York City, Pittsburgh, Tulsa, Houston, Los Angeles

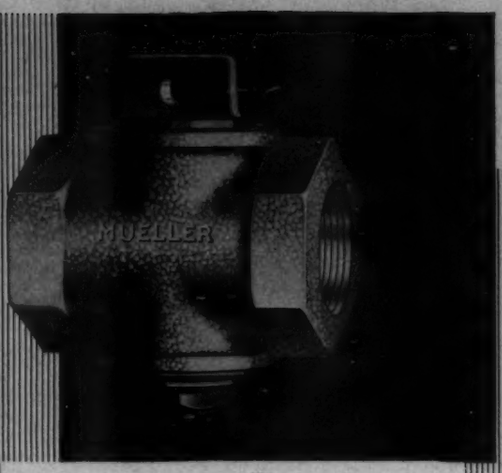
Cleveland Gas Meters have a reputation for dependable service, the result of over thirty years' experience in manufacturing.

Our thoroughly organized and completely equipped factory assure you that the workmanship, materials, accuracy and general efficiency are unequaled.

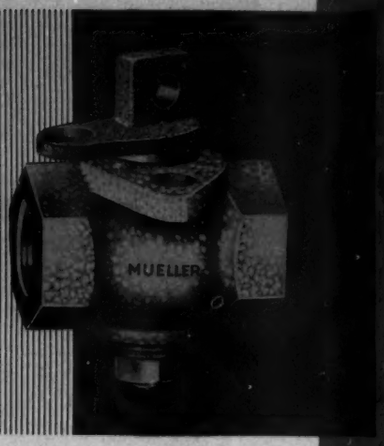
"A" Type Meters "B" Type Meters

THE CLEVELAND GAS METER COMPANY

2168-2180 East 65th Street Cleveland, Ohio



At left: Mueller G-11100 Flat Head, Iron Body Brass Plug Service Stop. *Below:* Mueller G-11080 Iron Body Brass Plug Meter Stop.



Quality- *or service failures?*

It's not what you pay on the market—it's the cost of repairing failures that determines the price you actually pay for stops.

The name of Mueller has been a guarantee of value for over three-quarters of a century. The enduring service of Mueller Iron Body Stops has caused leading gas companies to standardize on them the country over.

Made of the best gray iron—hot galvanized, with keys and washers of Mueller Red Brass and designed to provide the greatest strength where strength is needed, Mueller Iron Body Stops stand up under the heaviest installation strains.

(Established 1857)

MUELLER CO. **Decatur, Illinois.**
Branches: **New York, Dallas, San Francisco, Los Angeles**
Canadian Factory: **MUELLER, Limited, Sarnia**

MUELLER

Write for the complete catalog of Mueller gas service goods

Insuring uniform quality of refractories

Possibly you have noticed a marked difference in the life of your furnace linings made from the same grade of brick. To eliminate such a possibility and to insure the uniform quality of refractories, the General Refractories Co. maintains a modern, well-equipped laboratory at the Baltimore, Md., works.

From raw materials to finished products, complete control is maintained. Company owned deposits furnish the highest grade materials from which General Refractories products are made.

Day in and day out tests of samples, sent periodically from each of the 15 General Refractories plants, are being made. The laboratory equipment is such that actual plant operating conditions can be maintained throughout the test. This is merely one reason why you are assured of the uniform quality of General Refractories products.

Our many years of experience in meeting practically every refractory need has given us a valuable knowledge of customers' requirements. Bring your refractory problems to a General Refractories representative.

GENERAL REFRACTORIES COMPANY

106 South 16th Street, Philadelphia, Pa.

District Offices: Boston Buffalo Chicago Cleveland Detroit New York Pittsburgh
Seattle, Washington (Representative—F. T. Crowe) Montreal, Canada (Representative—Webster & Sons, Ltd.)

3073

Measure Stack Gas Temperatures

Citizens Gas Company, Indianapolis, Ind., using 4 Brown Pyrometers "to show balanced operating condition and to maintain standard heating practice throughout 24-hour period... Our Brown Pyrometers have always given satisfactory service and required very little maintenance."

HIGH stack gas temperature means waste heat. Too much gas being burned.

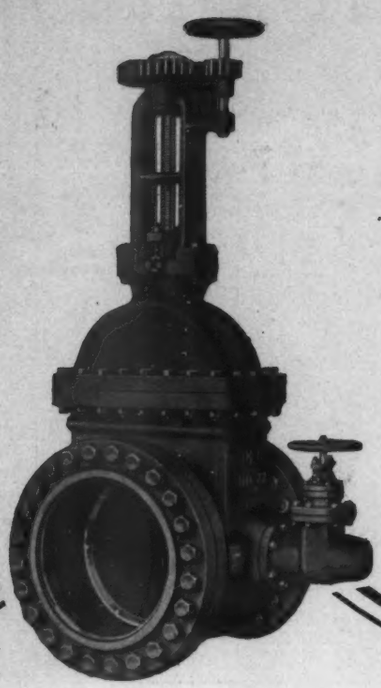
Low temperature means low oven heat—or leakage.

Use of accurate recording pyrometers provides a dependable means of checking operating temperatures to maintain the proper balanced operating condition. Write for Brown Pyrometer Catalog and other data.

THE BROWN INSTRUMENT COMPANY,
4473 WAYNE AVE., PHILADELPHIA, PA.
Branches in 20 principal cities

"To measure is to economize."—Pascal.

Brown Pyrometers



By Invitation Memo...

Controlling the Gas Line

Darling makes valves that will stand the gaff of heavy pressure gas line service. The very type of construction insures it. The revolving discs insure ease of operation and the closing and opening is effected in such a manner as to insure the tightest possible seating and minimum wear on seat faces. *Each* valve is carefully tested and examined for hidden defects before shipment.

The Darling Valve illustrated is an 18" No. 72 O. S. & Y., Double Disc Parallel Seat, Outside Screw & Yoke Rising Stem, Darval Semi-Steel Bronze Mounted, Flanged End Gate Valve equipped with Spur Gear, By-Pass and Companion Flanges.

DARLING VALVE & MANUFACTURING CO.

Williamsport, Pa.

NEW YORK CHICAGO OKLAHOMA CITY HOUSTON

DARLING GATE VALVES

An actual photograph of 12" unit installation.

Hundreds of similar installations have a record of more than twenty years continuous service.

Reynolds Products

for all kinds of Pressure Reduction—for either artificial or natural gas.

Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

Valve—
- Automatic Quick-Closing Anti-Vacuum

THE Reynolds District Regulator is the finest station regulator made, and actual performance tests prove its superiority. The Regulator illustrated above is capable of maintaining a constant pressure on its outlet side, up to capacity, as long as the inlet pressure is greater than the outlet pressure. This Regulator gets its power from the high pressure side, through the High Pressure Auxiliary Regulator, and the auxiliary system acts as a complete control at all times. Optional equipment at no increase in price makes the Reynolds District Regulator a universal installation. Our Engineering Service will solve your distribution problems.

Reynolds
Gas Regulator Company
Anderson, Indiana

ESTABLISHED 1892

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Greetings and Best Wishes for the New Year

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San Antonio Machine & Supply Co.
Virginia, Norfolk,
Empire Machinery & Supply Corp.
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Southern Ry. Supply Co.
Washington, Seattle,
Cragin & Co.
Washington, Spokane,
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Fluxes Slags Abrasion Erosion Heat Clinkers

Combat These Conditions With the Super-Refractory . . .

ADAMANT—ADACHROME

GAS plant officials have long sought a super-refractory with resistance to the action of low-melting fluxes or slags, fusible coal ash, clinkers, abrasion of descending fuel and other destructive elements encountered in water gas generator operation.

ADAMANT-ADACHROME Mixtures are the sought-for Super-Refractories. In these Mixtures, ADAMANT Fire Brick Cement is used as the binder for ADACHROME *Fines* (for laying up the brick), and also as the binder for ADACHROME (for surface coating applications by means of The ADAMANT Gun, as well as for patching mixtures).

Gas Plants use the ADAMANT Gun (Price $25.00) for applying coatings of ADAMANT - ADACHROME Mixtures in boiler settings, generators and other equipment employing refractory construction.

ADAMANT comes in 100 lb., 250 lb. and 400 lb. air-tight metal containers. ADACHROME and ADACHROME *Fines* are shipped dry in 125 lb. paper-lined burlap bags.

For purposes of comparison of the service in generators or other refractory construction, we shall be glad to furnish a trial quantity of ADAMANT-ADACHROME *Fines* or ADAMANT-ADACHROME. Send for complete details of this offer, and a copy of the new booklet describing these Super-Refractories. Write us today.

BOTFIELD REFRACTORIES CO.

Swanson and Clymer Streets
Philadelphia, Pa.

For a Long Furnace Run, Use The ADAMANT *Gun*

ADAMANT FIRE BRICK CEMENT

Whenever You Use a Fire Brick, Use ADAMANT, *the Original High Temperature Cement*

Everything for OXWELDING and CUTTING

—wherever you are

Gases, apparatus and supplies—are immediately available in every industrial section of the country through the remarkable distribution system of these associated companies, comprising 93 manufacturing plants and 467 warehouse stocks.

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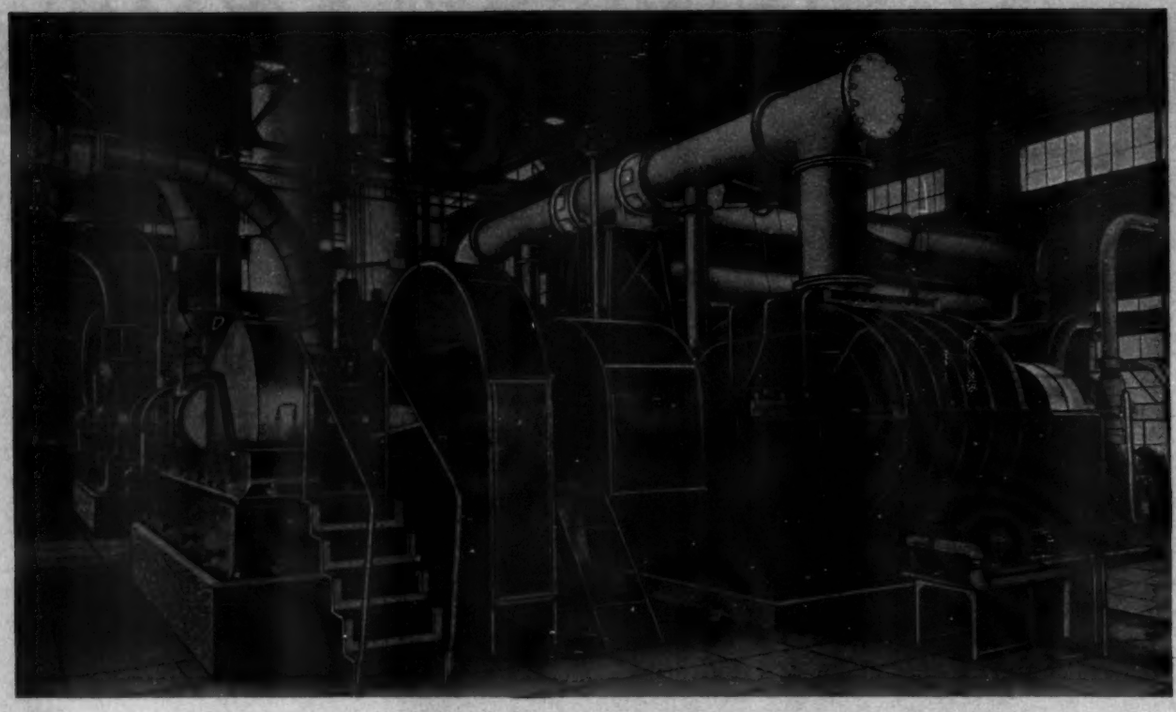
ROOTS



Two Roots No. 12½ Heavy Duty Gas Pumps Installed in large Southern By-Product Coke Plant.

Roots Service

Roots service is dependable, satisfactory service. From conception to the finished product every detail is carefully wrought and inspected.

Oversize shafts, heavily ribbed cases, adjustable self-oiling bearings, sturdy gears of *conventional* 14½° involute tooth design, exact clearances, and the absence of internal friction mean added service from Roots Gas Pumps.

Secure the best by specifying that it be a Roots product—regardless of whether you need a Gas Pump, Meter, Vacuum Pump, Liquid Pump, Blower, Gate, Valve or Coupling. Write for details.

The P. H. & F. M. ROOTS CO.

CHICAGO Peoples Gas Building

CONNERSVILLE, INDIANA

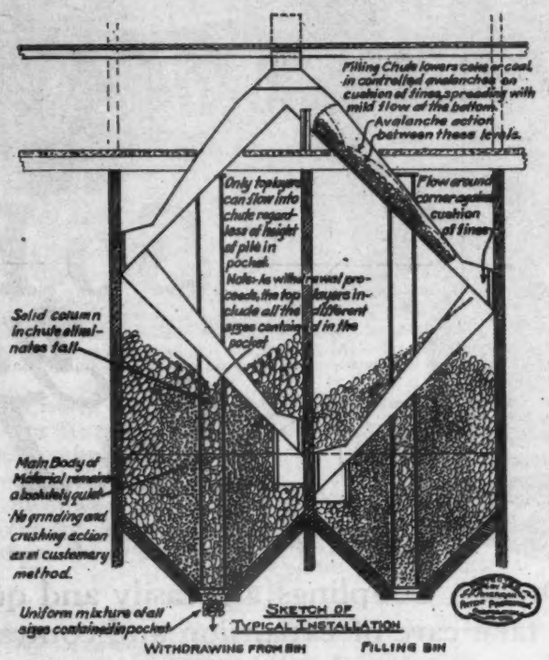
NEW YORK 120 Liberty Street

Originators of the Double Impeller Rotary Principle

Coke and Coal Breakage Reduced
Uniform Mixture of Sizes Assured
at the Same Time!
The ADAMS PATENTED PROCESS and CHUTES

The Result of Eighteen Years of Research and Study on Breakage and Segregation Problems

Nearly three years of use in various types of plants have proven the Adams Patented Process and Chutes to be one of the most beneficial improvements recently presented to the gas and coke industry.


Filling Chute lowers coke or coal in controlled avalanches on cushion of fines, spreading with mild flow at the bottom. Avalanche action between these levels.
Only top layers can flow into chute regardless of height of pile in pocket. Note—As with grown products, the top layers include all the different sizes contained in the pocket
Flow around corner cushion of fines
Solid column in chute eliminates fall
Main Body of Material remains absolutely quiet—No grinding and crushing action as in customary method.
Uniform mixture of all sizes contained in pocket
SKETCH OF TYPICAL INSTALLATION
WITHDRAWING FROM BIN
FILLING BIN

Both filling and withdrawing chutes are entirely self acting with no moving parts to get out of order. They can be designed for any type of site or pocket.

Process and chutes patented, and patents pending.

Eliminate the greatest source of resistance to domestic coke sales.

Eliminate slugs of fines and insure a uniform mixture of sizes in watergas sets.

Entire cost returned in savings made in one year where any appreciable tonnage is handled.

We solicit an opportunity of stating what can be accomplished for you in your particular plant.

Patent rights controlled solely by

EATON–KENT INC.

Engineers and Manufacturers

Specialists in flow control and breakage reduction in the handling and storing of coke, coal and other friable materials.

Boat, car and truck loaders **Storage bin discharge and withdrawal equipment**

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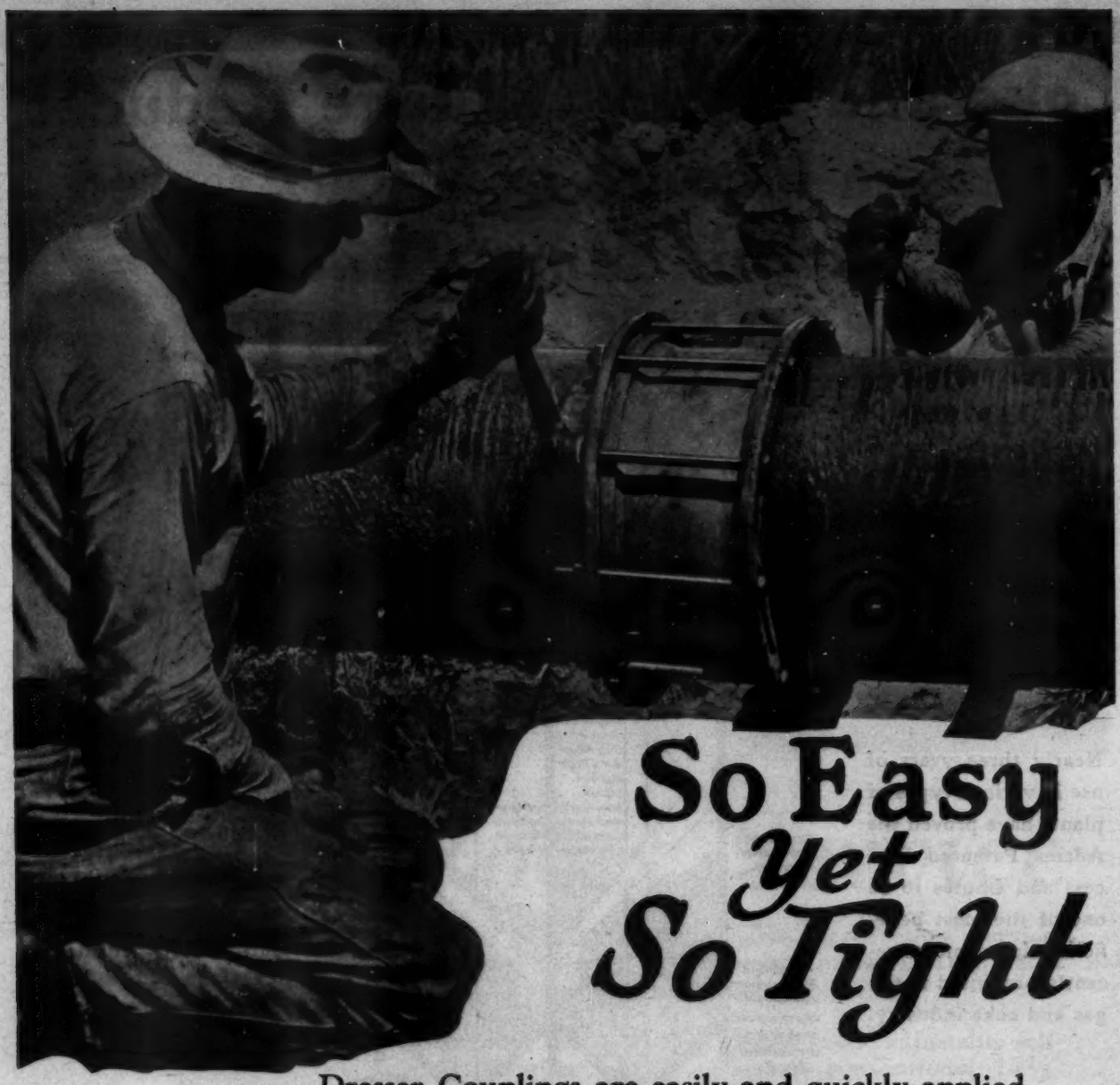


So Easy *Yet* So Tight

Dresser Couplings are easily and quickly applied. They take care of expansion and contraction and will remain permanently tight.

S. R. DRESSER MFG. CO., Bradford, Pa.

DRESSER Couplings Dominate

LOSE LESS GAS - ALUMINUM PAINT KEEPS TANKS COOL

All over the country you will find Gas Holders, Hortonspheres, Pressure Storage Tanks and gas equipment of every kind protected and beautified by Aluminum Paint.

ALUMINUM PAINT effects considerable savings in the amount of gas lost from Hortonspheres and pressure storage tanks through blow-off valves, in excessively hot weather.

For Aluminum Paint *reflects* the sun's rays instead of absorbing them—keeping tanks cooler and so reducing the loss of gas through expansion.

Aluminum Paint protects the tanks themselves from the destructive action of the elements. The tiny flakes of pure Aluminum "leaf" together, forming a highly waterproof coat-of-metal that cannot rust or corrode and effectively combats harmful fumes and gases.

Silvery Aluminum Paint beautifies gas tanks and other outside equipment. It gives an impression of cleanness and efficiency. It marks a well-managed plant.

Trade Mark

The pigment base for the better grades of Aluminum Paint is ALBRON made of pure ALCOA Aluminum.

In buying Aluminum Paint, tell your dealer how you propose to use it—and whether indoors or out. Most good paint dealers are prepared to furnish the kinds best suited to your needs. If yours is not, write us, giving his name and address, and we will see that he is supplied.

Write for the booklet "Aluminum Paint" which contains information important to every Gas Plant maintenance man.

ALUMINUM COMPANY OF AMERICA

2412 Oliver Building, Pittsburgh, Pa.

Offices in 19 Principal American Cities

ALUMINUM IN EVERY COMMERCIAL FORM

THE COAT OF METAL PROTECTION

ALUMINUM PAINT

"IT LEAFS"

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE and NEW YORK

DESIGNERS AND BUILDERS OF:

Carburetted Water Gas Plants
Complete Coal Gas Plants
By-Products Plants
Salt Water and Fresh Water Condensers
De Brouwer Charging and Discharging Machines
Purifiers - Steel Tanks - Shaving Scrubbers
Vertical Waste Heat Boilers
Gas Holders

View of Main Plant, Located at Baltimore

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900.

HENRY M. RILEY, *Editor*

Let's Make Gas Fashionable

WHEN MR. INSULL, at the Chicago A. G. A. Convention, indicated the vast potential market to be supplied with fuel by the American gas companies, there were doubtless 1 any of his audience who considered his estimates as a pretty word picture, pressed into service for the occasion. Even dividing his figure by two we still failed to warm up to it, for the simple reason that we have not yet made gas fashionable, in the strict sense of the word.

Some five years ago, if any well-posted shoe man had called together the best minds in his business and had quietly advised them, "Gentlemen, in 1928 our industry will use one million reptile skins in its product," there would have been a call for the stoutest strait-jacket extant. The answer is that some energetic men with a trifle of horse sense made the desire for these skins in footwear fashionable and to-day the shoe business bids fair to overtop the record set by Ireland's patron saint a thousand or so years ago.

One might argue that the analogy is far-fetched, in that gas of itself cannot be fashioned into an article of dress, to be paraded up and down the avenue. Very well then, neither can the electric waves that actuate your radio receiver be worn about town to the admiration of the onlookers. In turn, if you will contend that radio satisfies the pleasure-seeking side of one's existence, we will counter that the widespread use of gas will abolish a number of handicaps in the factory and home and thereby put mankind in a better position to satisfy such pleasure-seeking.

FROM THE standpoint of gas as a domestic fuel it is logical that it should be difficult to sell old-fashioned gas appliances for the modern apartment or fine home kitchen.

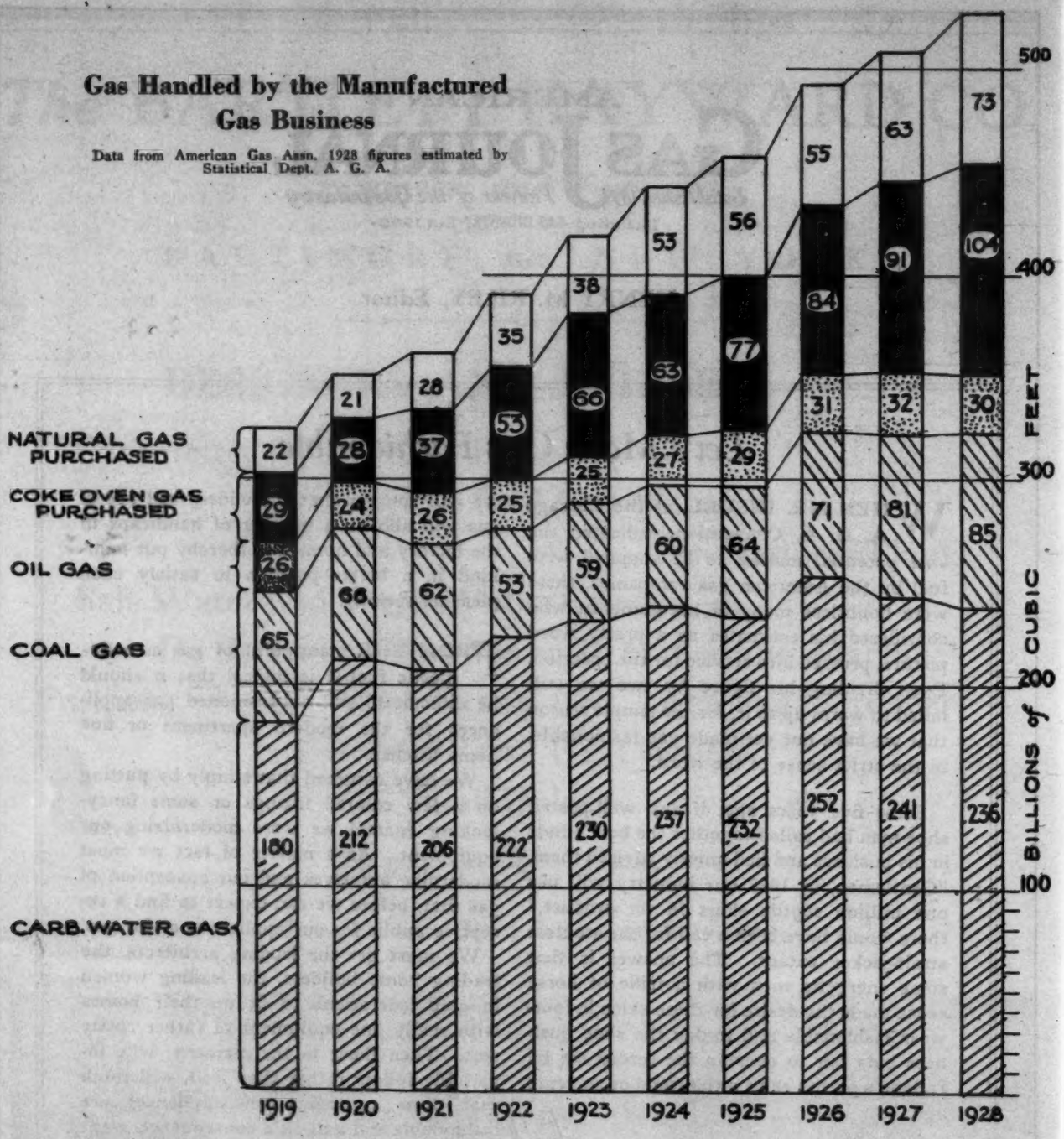
We have assumed that simply by putting on a few colored fittings or some fancy-looking enamel we were modernizing our equipment. As a matter of fact we must modernize ourselves and our conception of gas first, before we can expect to find a receptive public for our appliances or for gas.

We must get the leading architects, the leading home builders, the leading women in club federations to fit up their homes with really fine equipment of rather costly sort. Then those in the majority, who invariably follow rather than lead, will think that these expensive gas appliances are fashionable and will, as a consequence, want them.

It is a mistake to advertise gas solely because it is economical. It can be sold more successfully in the home if it be regarded as convenient or stylish. It is well enough to talk efficiency to the industrial user. But to talk efficiency alone to the housewife is not safe under modern merchandizing conditions.

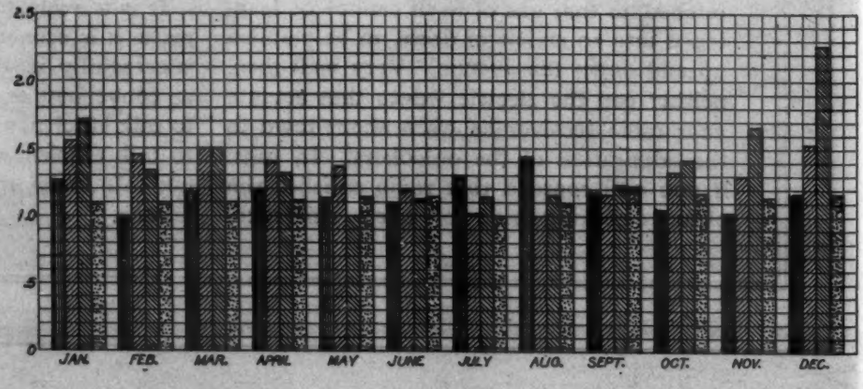
Gas Handled by the Manufactured Gas Business

Data from American Gas Assn. 1928 figures estimated by Statistical Dept. A. G. A.



Relative monthly changes in send-out of Manufactured Gas by certain gas companies in some of our large cities for a period of one year.

Data from U. S. Bureau of Mines.



The Gas Industry Faces Changing Conditions

Its Past Record of Accomplishment Guarantees Ability to Accommodate Itself to the New Order

IT IS somewhat trite to say that any business or industry faces conditions that are in a state of flux, for that is most always the case. But, our own industry enters the new year with such conditions changing very rapidly. Thus, we find ourselves cognizant of the fact that we have competition of a very energetic sort; competition that has little or nothing to do with heating the home, or cooking the meal. The radio, the automobile, the increase in the average man's time for leisure, the almost precipitous rush for pleasure and recreation in a thousand and one different ways are taking so generous a portion of the family dollar that even the most stupid can sense that we must bestir ourselves in order to keep in the race —or else, like the aged warrior with palsied limbs and dull-edged sabre, ponder mournfully over memories of former greatness.

Fill it up, Sonny!

Referring particularly to the domestic phase of our business, if, as many stoutly maintain, we are entering the "can opener era" in the home and will gradually see this load whittled away, then we must stop up the breach with generous increases in house heating, incineration, automatic water heating, refrigeration and house cooling. More, we must painstakingly study the customer's whims and develop the gas range and any of the smaller appliances that a demand could be created for.

It would seem that the time is past for us to whine that a rapid increase in gas house heating will give rise to a fearsome lump in our load curve and cause a worrisome expenditure in mains and gas making equipment. Near at hand yawns a mighty potential field for gas in its Industrial application that will serve as a very comforting cure for such a protuberance. And, after all, bearing in mind that Mr. Average Customer is at times irritatingly recalcitrant in doing things his way, we might be far better off anticipating a lump in the load curve than later nursing a swelling on our economic shins administered in the ruthless rush of this gentleman to change his mode of living.

The technical or gas manufacturing end of our business also finds itself rather rapidly metamorphosing. It is obviously up to its eyebrows in the deep water of Chemical Engineering and must perforce gradually alter its stroke to carry on.

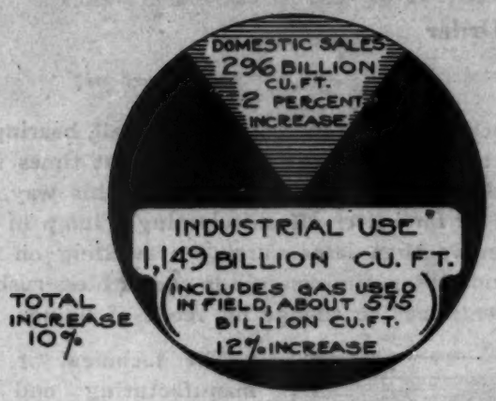
NEEDED,—REAL SALESMANSHIP

IT IS the opinion of the American Gas Journal that one of the outstanding accomplishments in the Industry during the past year was the establishment of a real and smooth running course in salesmanship. However, regardless of the inherent merits of this course its correct functioning is dependent on several important factors as well as executive vision and gumption of a high quality.

We must select our salesmen with the idea that they will measure up much higher than mere door bell ringers. They must be men of good average mental breadth; men, indeed, who would have made good doctors, or good lawyers, or, if you will, good gas engineers if they had followed such a bent. But such good, raw material is not to be had for a low rate of pay. It commands comparable wages,—and gets them. We should get ourselves into the position where we can truthfully say, "Mr. Salesman, work hard, carry on, deliver; and no position in our Industry, from Commercial Manager to Chairman of the Board, is beyond your reach."

Distribution of Gas Sales in the United States

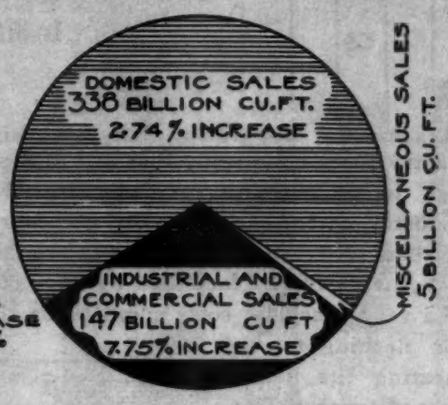
Natural Gas (through 1927)
~~Manufactured Gas (for 1928)~~



DOMESTIC CUSTOMERS 3,984,000 7% INCR.
AVER. PER M FOR DOMESTIC CUSTOMERS
1926 – 58.4¢ 1927 – 60.8¢
VALUE PER M AT WELLS: 1926-9.5¢ 1927-8.0¢
VALUE PER M AT POINTS OF CONSUMPTION: 1926-22.9¢ 1927-22.0¢

Data from U. S. Bureau of Mines

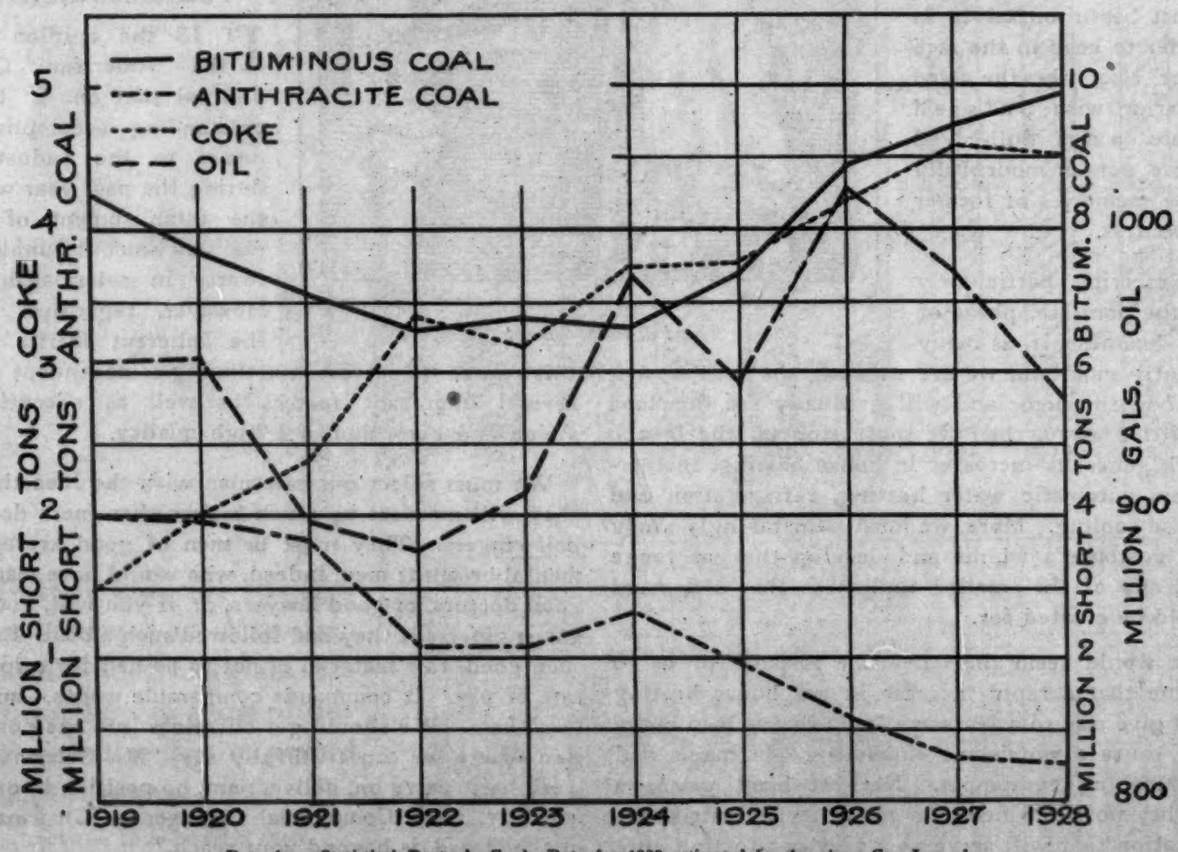
Manufactured Gas (for 1928)
~~Natural Gas (through 1927)~~



CUSTOMERS 11,800,000 3.06% INCR.
MILES of MAIN 93,500 2.3% "
OPERATING REVENUE $519,000,000 3.6% "
INVESTMENT 3 BILLION DOLLARS

Preliminary estimate by Statistical Dept. A. G. A.

Fuels Used in the Production of Manufactured Gas



Data from Statistical Dept. A. G. A. Data for 1928 estimated by American Gas Journal

Effective salesmanship also entails a well planned and courageously executed advertising program as well as appliances and equipment that is just a bit ahead of the times.

HOUSE HEATING AND HOUSE COOLING

PROPER INSULATION is the key that will open the door to a large volume of gas house heating, but merely hoping that new houses will be insulated does not answer the question. In addition to the Gas Industry's interest three other factors are to be reckoned with in order to have prolific house insulation. First, the home owner must be educated so that he will demand insulation, and this whether he immediately expects to heat with gas or other fuel; next, the builder or architect must be made to see the additional selling point which insulation will give; lastly, the insulation manufacturer must be induced to further the cause.

It is amazing how many people building high grade houses know next to nothing of the desirability of having these homes insulated. And they will know but little more until we and the others interested tell them the story through the medium of widespread publicity. Also, a large number of architects and first class builders are unaware that by spending two or three hundred dollars for insulation more than double this amount can be legitimately added to the sale price of the house. But the architects and builders must be sold the idea.

House cooling, which is also tied up with the question of insulation, is worthy of immediate and careful study, always with the thought uppermost that we must not permit electric refrigeration to precede us in this field.

FUTILITY OF NON-AUTOMATIC WATER HEATERS

WE ASK in all humbleness, why is a non-automatic gas water heater ever installed? When one adds together the cost of a hand operated tank heater, the cost of the tank and the expense involved in making the connections, the difference of this total and the cost of a small automatic system in one composite unit does not form a serious sales barrier. However, it is generally a direct index of the salesman's lack of selling ability. It would seem a fair estimate to say that more than two-thirds of the total water heater sales should be of the automatic type. Anyone who can afford the least expensive automobile can be sold an automatic water heater.

Make no mistake, in many cases when we install a hand operated water heater, we pave the way for the later installation of a small coal-fired water heater, due to the fact that the housewife gets tired of going to the cellar to light the burner—and exceedingly disgusted in forgetting to turn it off at the right time. As a somewhat parallel case, ask the average owner of an electric radio a year from now whether he would not want to go back to the unit operated from batteries; or whether the automobile owner wouldn't be tickled to grind away laboriously with a crank in the front of his car. Sell automatic gas water heating this year; the "side wheeler" is antiquated.

A MIGHTY MARKET

THE USE for Industrial Gas can be enormously increased and the remaining field for its application will be a very large one. Real, well-paid engineer-salesmen, backed by the proper publicity, are the mainspring in this direction. A proper schedule of rates is also of importance and a knowledge of all competitive fuels and their characteristics in operation in the furnace, as well as a detailed survey of the prospective field demand careful study.

Industrial Gas Superintendents would do well to freely interchange ideas. In this regard reports from the Industrial Section of the A. G. A. should be digested and any questionnaires carefully and fully filled out. Executives should encourage their Industrial Gas Superintendents to take trips of inspection to other cities because we are all interested in the common cause, which in this case is non-competitive.

With the increasing use of Industrial Gas the smoke evil will be gradually abolished. This is a matter that vitally concerns the health of the various communities and in some manner a plan should be devised which would have as its objective the enlistment of the active suppport of the medical profession in bringing about the abolition of smoke and soot.

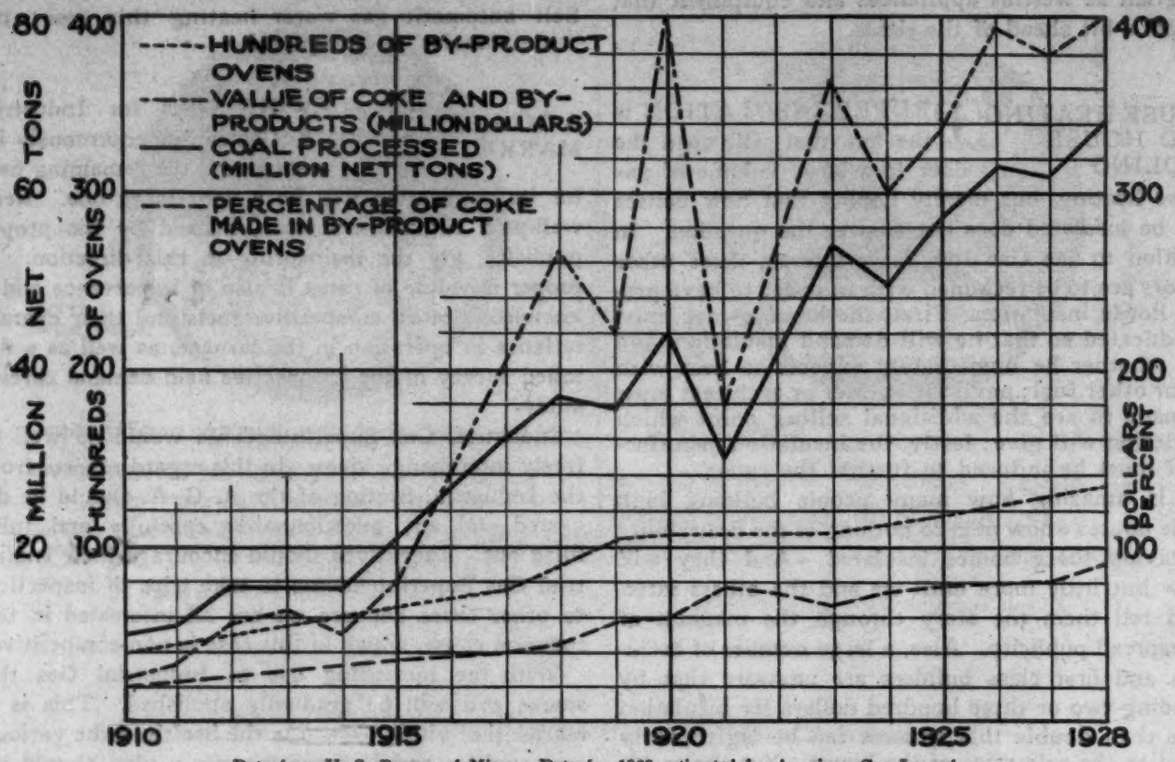
TECHNICAL TRENDS

THE ADOPTION of coke-oven gas to supply the base load of city supply has been noted as a trend in the industry for several years. This development made marked progress during 1928 in the establishment of numerous new plants utilizing coke ovens primarily for the manufacture of base-load city-gas supplies. New York City, Brooklyn, Philadelphia, and New Haven are but a few of the conspicuous examples of this development; many other examples in smaller cities could be cited as typifying the same trend.

This adoption of coke-oven gas supply has forced the gas man into the coke and by-product business on an enlarged scale. Furthermore, this change in by-product interest has come just at a time when some of the phases of the business have been passing through revolutionary developments. Hence, it has become necessary for public-utility gas executives to study by-product trends and by-product markets as never before.

They now find themselves as much interested in the ups and downs of the fertilizer business and in the building of highways and treating of timber as they formerly have been in the changes directly

By-Product Coke Industry Shows Significant Trends



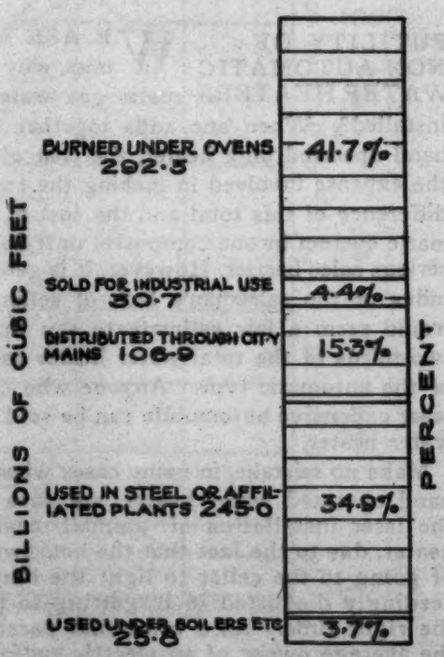
Data from U. S. Bureau of Mines. Data for 1928 estimated by American Gas Journal

Materials Handled and Production of Coke and By-Products at Coke Ovens

	1926	1927	1928
Coal processed (million net tons)			
Beehive	19.2	11.2	7.1
By-product	63.6	63.2	68.6
Coal gas	5.0[1]	5.1[1]	5.4[1]
Total	87.8	79.5	81.1
Coke production (million net tons)			
Beehive	12.5	7.2	4.4
By-product	44.4	43.9	48.0
Coal gas	3.0[1]	3.2[1]	3.5
Screenings and breeze	4.4	4.1	4.3
Total	64.3	58.4	60.2
Coke oven gas (billion cubic feet)	707	701	770
Tar (million gallons)	530	547	600
Crude light oil (million gallons)	164	164	170
Ammonia, total sulphate equivalent (thousand net tons)	691	717	600
Napthalene (million pounds)	7.9	8.3	8.7

Data for 1926 and 1927 from U. S. Bureau of Mines.
Data for 1928 estimated by American Gas Journal.
[1]Data estimated by American Gas Journal.

Disposition of Gas Obtained from By-Product Coke Ovens in 1927.



Data from U. S. Bureau of Mines.

affecting industrial gas markets. The modification of fertilizer technology determines whether the gas man shall make ammonium sulphate or ammonia liquor. The rate at which tar-treated timber is used and the rate at which tar-bound macadam roads are built become of direct concern to the gas man because they indicate the rate of expansion of major tar-products markets.

It has recently been stated by one of the leading executives in the coke-oven business that further changes in that industry are likely to come almost altogether through the use of coke ovens for city-gas supply, since the metallurgical coke market is apparently satisfied, or even over supplied, with existing plants. This is merely another way of stating that the gas business has taken on during 1928, more than ever before in its history, the aspect of a multi-product chemical business.

A study of gas statistics leads us to observe that it is rather surprising to notice an actual decrease in total volume of water gas and oil gas made in 1928 as compared with 1927 despite the fact that the industry was going forward in total send-out. To some extent this was probably caused by conversion of some plants to a natural-gas supply. During 1929 we will have a still further trend in this direction. Denver, Memphis, and a considerable number of other mid-western cities will be climbing on the natural-gas band wagon.

Numerous factors are bringing about the increase in pressures used for gas transmission and increasing the distances to which gas is sent. Some of these factors are: Consolidations of companies in nearby towns; absorption of small suburban companies by metropolitan concerns; movement of coke-oven gas from metallurgical works into the city; extension of service to suburban communities not heretofore supplied. In connection with this trend it has been found necessary to use many more welded lines, since ordinary joints occasion excessive leakage at the high pressures which are now coming into fashion. Fortunately, it has been shown by practical experience that the research results on welding of pipe lines are sound. Bronze-welded cast-iron lines and steel-welded steel lines are both economic of installation and are proving substantially bottle-tight in service. In part the use of welding has permitted high-pressures and in part the desire for high pressures has compelled the use of welding. Thus it is hard to say which is the cause and which is the effect. They are contemporary and mutually dependent trends.

MANAGEMENT PROBLEMS AND CONSOLIDATIONS

MORE FREQUENT turnover of invested capital would be the largest achievement that could be made by gas-company managements.

This means that we must wherever possible cut back on the investment required per thousand feet of send-out and that we must make the maximum possible drive for high-capacity-load-factor business. The industry should go after a large number of customers who can afford to take gas for the six or eight months per year when the house-heating requirements are low. It might possibly be worth while to have a few customers who could take gas at a very low seasonal rate for boiler firing. Such customers could use oil four to six months and gas for six to eight months with practically no increase in capital charge on their part, and they would furnish the gas man with ideal load conditions, permitting practically a flat load curve through the 12 months.

With a flat load curve the capital turn-over might come to be about once in two years instead of once in four or five years as now. As a matter of fact, with proper adaptation of water-gas and coal-gas plants and with the careful planning of rate schedules it might be possible to work the capital turn-over up to once per year and thus put the gas business somewhere near other manufacturing industries.

Consolidation of many companies under separate managements has introduced some new problems of coordination. It has not at all eliminated the small-company problem; it has merely transferred that problem from the desk of the local independent company manager to the desk of the general manager of the holding company off at a distance. These consolidations are likely to continue and are likely to benefit the public, the security holders, and the skilled holding-company executive. But it is a mistake to assume that the problems are all solved by the consolidation itself.

WORK,—THE ANSWER

OUR OWN industry, in common with all other human endeavors, must look, in the main, for success through the medium of hard work, interspersed with a modicum of brains and imagination. We talk of research and are prone to view it as obtaining results through some mysterious process. As a matter of fact nearly all research, regardless of the field, has as its basis a tenacity of purpose characterized by hard work, continuously kept up.

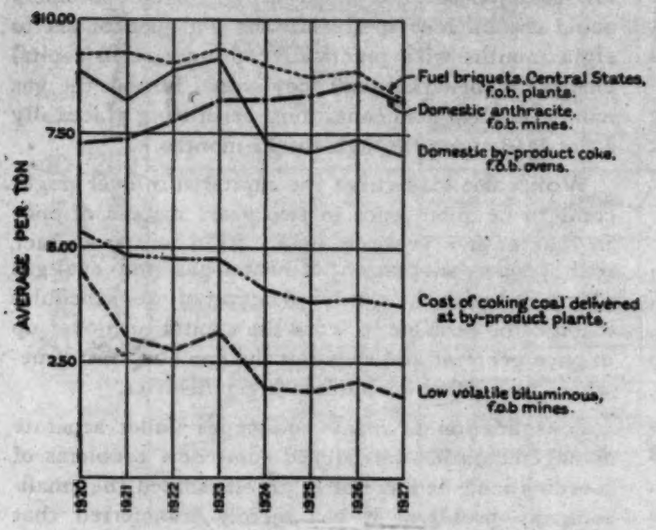
The Gas Industry enters 1929 far from needing a director general, a lord high commissioner, or what you will. Its problems are well defined and well known. It is ably supplied with imagination and brains. If anything is needed it is a will to cheerfully follow the dictates of the selfsame brains and imagination with the clinching hammer blows of hard work. The reward to those who will take off their coats and hustle should be well worth-while.

Allons!

Some Pertinent Data Showing the Use of Various Domestic Fuels in the United States

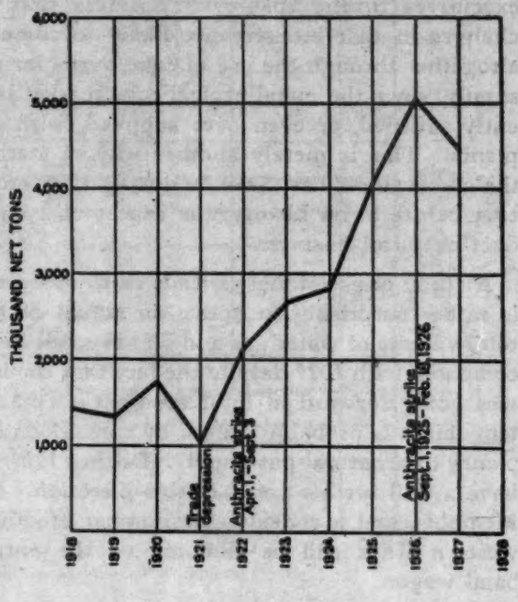
Price Trends of Solid Fuels Suitable for Household Use

(Anthracite prices per ton of 2240 lbs.; all others per ton of 2000 lbs.)



By-Product Coke Sold for Domestic Use

(1918 and 1922 data exclude non-commercial deliveries of coke to employees of certain steel companies, and are not precisely comparable with those for later years. The discrepancy is immaterial.)



Commercial Production of Anthracite and Total Supplies of Other Fuels Used for Domestic Purposes in the United States

	1924	1925	1926	1927
Solid fuels (net tons)				
Anthracite production:				
Shipments of domestic sizes	56,576,296	38,305,222	54,096,437	48,999,058
Shipments of buckwheat No. 1[1]	9,510,508	6,631,604	8,581,966	9,062,977
Shipments of smaller steam sizes	11,160,695	8,831,546	12,640,416	12,433,251
Local sales	3,043,939	2,884,577	2,687,411	3,046,770
Total commercial production	80,291,438	56,652,949	78,006,230	73,542,056
Anthracite exported	4,017,785	3,179,006	4,029,683	3,325,507
Anthracite imported, chiefly from United Kingdom	117,951	382,894	813,956	119,030
Fuel briquettes produced	580,470	839,370	995,332	970,468
Fuel briquettes imported	38	6,758	123,593	60,601
By-product coke sold for domestic use	2,812,771	4,085,068	5,056,568	4,702,529
Beehive coke sold for domestic use	139,886	392,698	386,045	75,219
Coke imported	82,833	201,579	284,548	168,859
Gas-house coke sold		About 1,300,000 tons a year.		
Petroleum coke produced[2]	761,100	991,000	995,300	1,145,200
Bituminous coal for domestic use[3]		From 56,000,000 to 77,000,000 tons a year.		
Oils (barrels)				
Oil used for heating houses[4]	2,800,000	5,000,000	8,800,000	11,000,000
Oil used for heating offices, hotels, apartments, schools, hospitals and buildings other than houses	No data	[5]12,100,000	14,266,000	14,800,000

[1] A considerable part of the buckwheat No. 1 is used for domestic purposes.
[2] How much of the petroleum coke produced was used for house fuel is not known. It is known that 314,000 tons in 1925, about 408,000 tons in 1926, and 430,000 tons in 1927 were used for refinery fuel.
[3] During the anthracite strike about 18,000,000 tons of bituminous coal, in addition to the normal consumption, was used to replace anthracite.
[4] Figures relate to heating seasons as follows: 2,800,000 barrels in season of 1923-24, 5,000,000 in season of 1924-25, 8,800,000 in season of 1925-26. The figure for 1927 represents the calendar year.
[5] Partly estimated.

Data on this page from U. S. Bureau of Mines.

"What Do You Mean---Public Relations?"

By Bernard J. Mullaney

Vice-President, The Peoples Gas Light and Coke Company, Chicago,
Vice-President, American Gas Association

AMERICAN GAS JOURNAL has asked for something on "the public relations outlook for the gas industry in 1929." There is a temptation to ask in return: "What do you mean—Public Relations"?

Waiving the seeming rudeness of it, there would be sense in the counter-question. Nearly every second man you meet has his private definition of Public Relations. So it is profitless to discuss the subject, unless we are all thinking about the same thing.

In my own private definition, Public Relations is the practically perfect analogue to Domestic Relations. The state of your relations is the measure of how you are getting along with your family on the one hand or with your customers—the public—on the other.

FROM THIS VIEWPOINT the public relations outlook of the gas industry is generally good—much better than it used to be. Perhaps the biggest single factor in the improvement has been the attention focused on the subject by the American Gas Association. The outlook will improve accordingly as the commonsense essentials of good public relations are applied.

Conservative financing, fair rates and good service, promptly, courteously and understandingly rendered, are among these essentials, with emphasis on the "rendered." Unsatisfactory personal contacts between company representatives and customers can nullify the best physical service on earth. Hence the importance of an informed and interested personnel—high morale.

Telling the world "all about it" is another essential. This may be only a fraction of the total public relations effort, but it is an essential fraction. It is the frosting on the cake; or more appositely, the yeast in the bread. Omit it, and results are cold, flat and soggy.

AGAIN THE ANALOGY to domestic relations applies. Just being "a good provider," in proof of loving your wife, will not satisfy. You have to tell her so. Likewise the gas company needs to tell its customers all it can get them to listen to about their mutual customer-and-company interests and contacts. When you have them understanding you as they understand why they have to stand in line at the ticket booth of a popular movie, you will have good public relations.

But this telling must be done with commonsense. Bragging and preaching and windy verbal strutting will not serve. Humanly explanatory and interpretative effect is the desideratum, and the more simply and directly it is sought, the better.

All of which is a round-about way of saying: put your company on the best practicable footing in respect to rates, service, general practices, and personnel, and then:

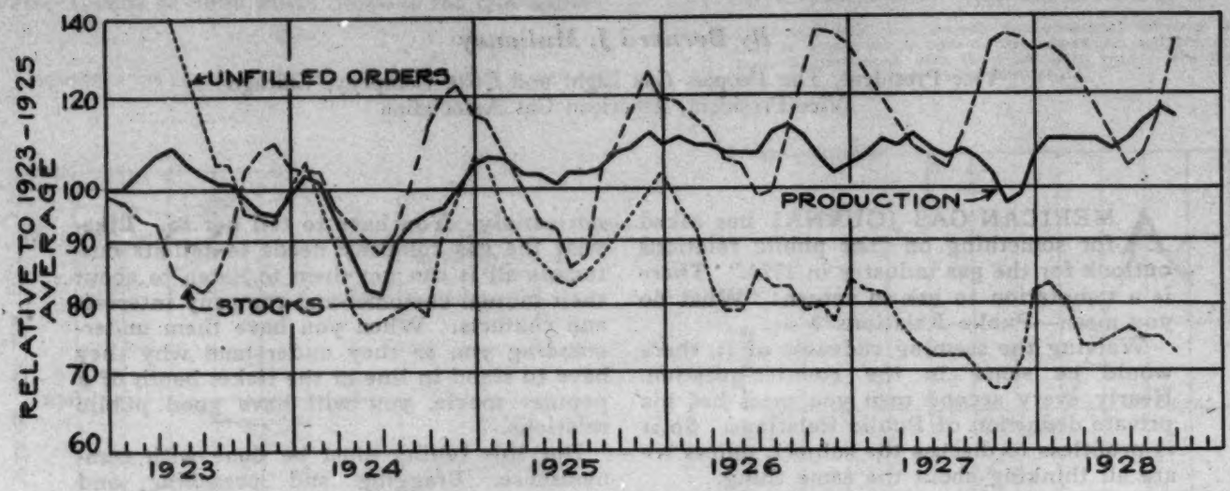
> Advertise your service as well as the appliances and merchandise you sell.
>
> Tell the newpapers whenever there is news to be told.
>
> When the newspapers send to you for news, meet them more than half way, and be frank.
>
> Invite, encourage and employ every other possible means of dispelling ignorance, doubt, mystery or suspicion of secrecy.

THE PUBLIC RELATIONS outlook for the gas industry is good because most gas companies are doing some or all of these things—doing more of them and doing them better each year. Results are cumulative. Continued doing will be ultimately the complete antidote to the curbstone efficiency experts, "vox pop" engineers and soap box economists who stray into some editorial sanctums, public offices and legislative halls, both state and national. They may continue to annoy us occasionally but they will be unable to hurt us.

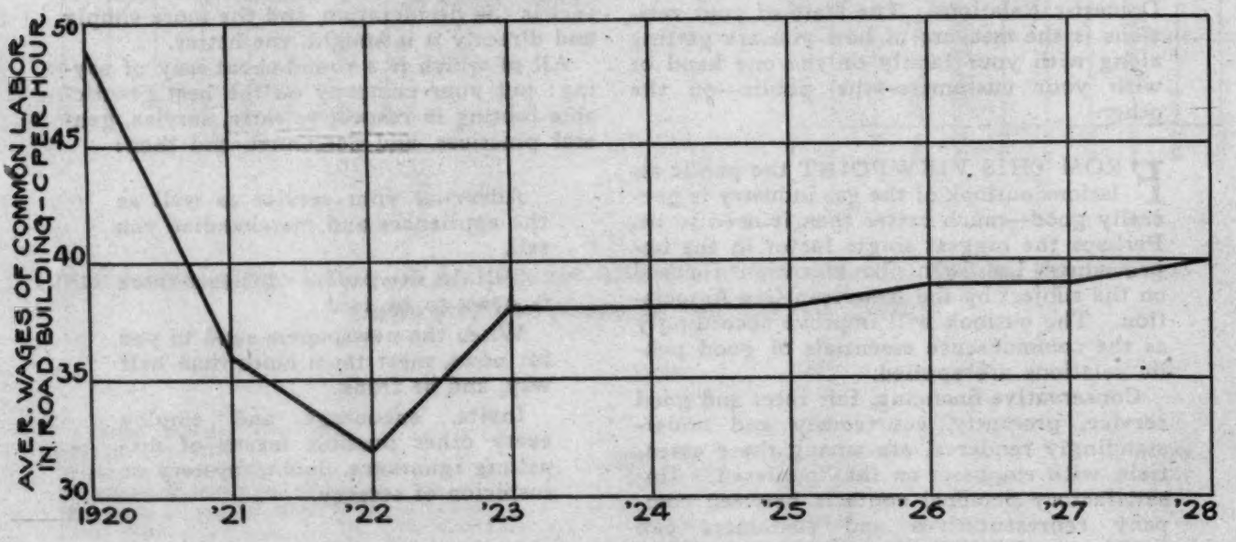
General Statistics of Interest to the Gas Industry

Production, Stocks, and Unfilled Orders for Manufacured Commodities

(1923-1925 monthly average = 100)

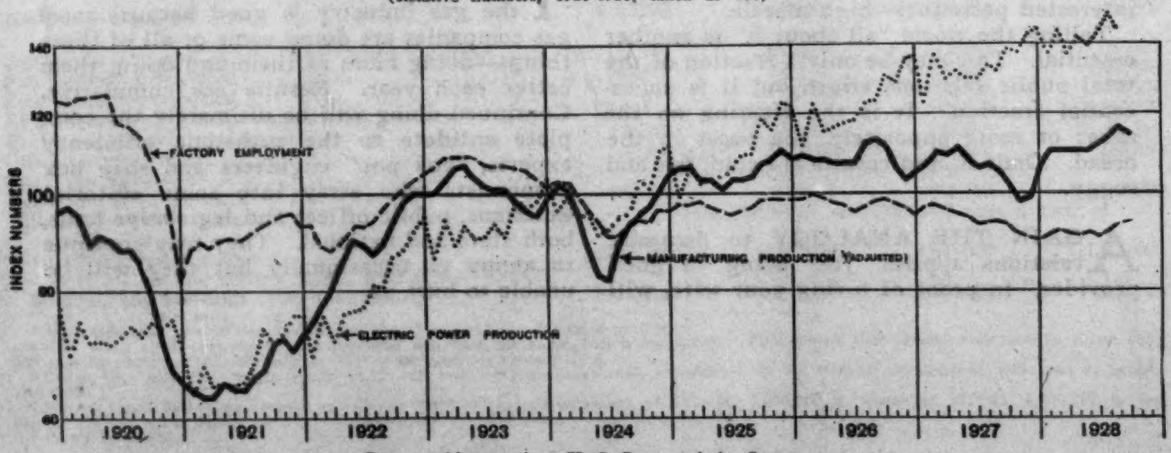


Wages of Common Labor in Cents per Hour



Factory Employment, Manufacturing, and Electric Power Production

(Relative numbers, 1923-1925, taken as 100)



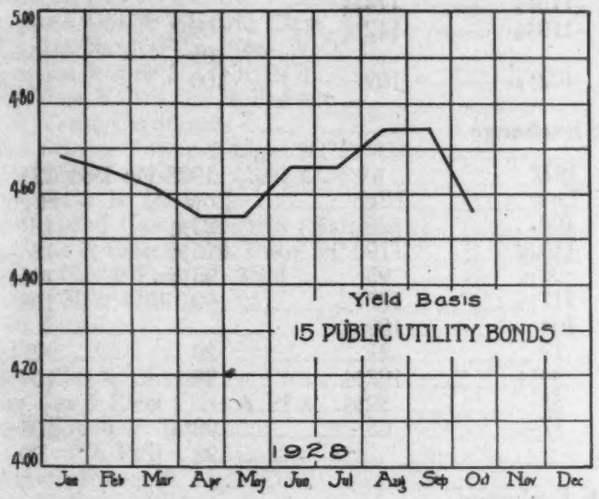
Data on this page from U. S. Bureau of the Census.

High Lights of Gas Utility Financing in 1928

By J. J. Berliner

Senior Member of The National Accounting Systems

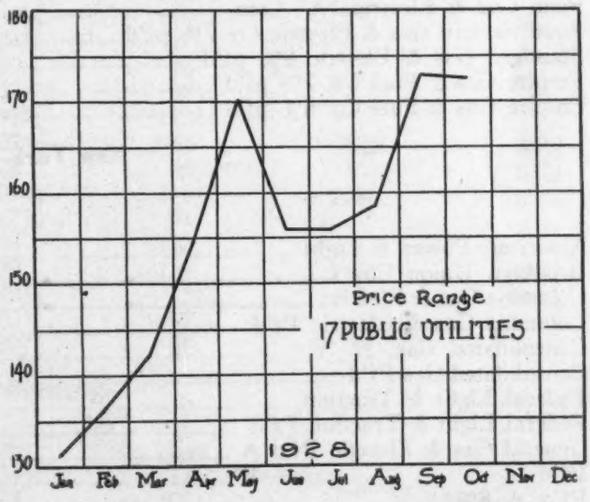
DURING the year 1928, financing done by gas companies amounted to well over $500,000,000. In the majority of cases, bonds were the means used in raising capital for the purpose of refunding previous issues and for the purpose of acquiring additions and extensions.



The bonds invariably carried a lower interest rate than those retired and therefore resulted in a saving of interest charges in the majority of cases. Gas companies during 1928, had to pay an average interest of 5.78% on the new bond issues.

Utility preferred stocks with a fixed income return have reflected the general trend of investment securities and are for the most part available on a more advantageous basis than at the start of the year. As far as dividend paying common stocks are concerned, the return, although indirectly supplemented in many cases by periodic stock dividends and frequent rights to subscribe to additional stock, is very moderate on a strictly cash basis, and the predominant reason for their acquisition is to be found in expectations of appreciation in principal to offset the absence of an adequate cash return.

Increasing recognition of the inherent strength in good public utility hands and admission to the legal list for investment by savings banks and trust funds of certain issues in this field have been responsible for narrowing somewhat the average differential in yields between utility and railroad hands. The former consequently have not shown to the full extent the decline experienced by bond prices generally from the peak levels of last spring hence there is no longer so great an advantage in respect to income return to be derived from the selection of utility issues for reinvestment in preference to rails. The desirability of public utility bonds is enhanced by the constantly increasing equitus almost universally in prospect.



QUOTATIONS OF GAS SECURITIES, 1927 AND 1928

Over the Counter

	1927 (as of Dec. 31)		1928 (as of Dec. 22)	
	Bid	Asked	Bid	Asked
American Gas & Electric	121	122	182	186
6% pf'd	108	108½	106	107
Associated Gas & Electric	20	22	16	18
Original Pf'd	54	56	55	57
6 Pf'd	97½	100	100	101
6½ Pf'd	100	103	100½	101½
7 Pf'd	104	106	103	103

	1927 (as of Dec. 31)		1928 (as of Dec. 22).	
Blackstone Valley Gas & Electric	134	137		
National Pomer & high pf'd	109	110	107	108½
Pacific Gas & Electric	26	26½	27	28⅛
Standard Gas & Electric prior pf'd	111	112	109	111

Boston Exchange

	1927		1928 (to Dec. 22)	
	Low	High	Low	High
Associated Gas & Electric Class A	36¾	50¼		
Massachusetts Gas Co. pf'd	84	124	109	155
Massachusetts Gas Co. pf'd	70	81⅞	75¾	88

Baltimore Stock Exchange

	1927		1928 (to Dec. 22)	
	Low	High	Low	High
Consolidated Gas & Electric Light & Power	5	77	67½	95
8% pf'd series A	127	130⅛		
7% pf'd series B	112½	117		
6½% pf'd series C	110⅝	114¾		
6% pf'd series D	110⅛	112¼	109½	114¼
5½% pf'd series E			105	108½
5% pf'd series F	102⅝	109	100	105¾

Chicago Stock Exchange

	1927		1928 (to Dec. 22)	
	Low	High	Low	High
Middle West Utilities	108	125	123¼	184
Middle West Utilities Pf'd	110⅜	119	116½	126½
Middle West Utilities 6%	90¾	95	93½	105½
Prior Lien pf'd	117½	127	99	108
Oklahoma Gas & Electric Pf'd	104	109		
Penn Gas & Electric "A" Com.	19	21	20	27½
Southwestern Gas & Electric Co. 7% pf'd	94½	102½	98	104⅜
Standard Gas & Electric 8% pf'd	55	59½		
Empire Gas & Fuel Co. 7% pf'd	57½	65	98⅝	105
Empire Gas & Fuel Co. 6% pf'd			95	99

New York Stock Exchange

	1927		1928 (to Dec. 22)	
	Low	High	Low	High
American Power & Light	54	73⅜	62¼	95
Brooklyn Union Gas	89⅝	157½		
Columbia Gas & Electric	82⅞	97	89½	138⅝
Columbia Gas & Electric Pf'd	99½	110⅛	106	110⅛
Consolidated Gas, N. Y.	94	125¾	74	113
Consolidated Gas Pf'd	93	103	97¼	105
Federal Light & Traction	37½	47	42	77
Federal Light & Traction Pf'd	91½	100		
General Gas & Electric Pf'd A	34	47½		
Pf'd B	35⅛	46		
Pf'd A 8%	113¼	123⅜		
Pf'd A 7%	100	110⅛	105	114⅞
Pf'd B 7%	96	105⅛		
Laclede Gas	173¾	267½	100	124½
Laclede Gas Pf'd	95	130	99	124½
Louisville Gas & Electric A Ctfs	23⅝	30½	28	41
Pacific Gas & Electric	31	50	43½	56⅛
Peoples Gas Light & Coke	126	168¾		
Public Service N. J. Pf 8%	125	135¼	134	150
7%	108½	120¼		
6%	98½	105	103⅜	115
Public Service Electric & Gas Pf'd	102	110½		
Standard Gas & Electric	54	66¾	57⅞	81¾
Standard Gas & Electric Pf'd	57⅛	66½		

Pittsburgh Stock Exchange

	1927 Low	1927 High	1928 (to Dec. 22) Low	1928 (to Dec. 22) High
Arkansas Natural Gas	6⅞	8⅞	2½	4
Dixie Gas & Utilities	7½	11⅜		
Pf'd	80	117		
Lone Star Gas	36¼	59¼		
Colorado Gas & Electric			90¾	131¾

Cincinnati Stock Exchange

	1927 Low	1927 High	1928 (to Dec. 22) Low	1928 (to Dec. 22) High
Cincinnati Gas & Electric	96¼	101⅞		
Cincinnati Gas & Electric Pf'd			97	100½

Philadelphia Stock Exchange

	1927 Low	1927 High	1928 (to Dec. 22) Low	1928 (to Dec. 22) High
United Gas Imp	89½	118½	114½	173½
Curb				
American Gas & Electric	68¼	125	117½	195
American Gas & Electric Class A	35	52		
American Natural Gas Com. V. T. C.	18½	19¼	16⅜	22
American Power & Light Pf'd	97½	109¾	100¾	107¼
Blackstone Valley Gas & Electric	98	154⅞		
Stock Trust Certificates	129½	140¼		
Cities Service Power & Light $6. Pf'd	90	95½	94½	103½
Cities Service Power & Light $7. Pf'd	100⅝	106⅝		
Pf'd B (60c)			8⅞	9⅝
Consolidated Gas & Electric (Baltimore)	50⅞	71		
Cont Gas & Electric 7% Prior Pf'd	101¾	109½	67½	95⅞
Empire Gas & Fuel 8% Pf'd	104¾	111¾		
Middle West Utilities			100	125⅝
$6 Pf'd	90½	95½		
$7 Pf'd	105¾	118½	123	180
Pacific Gas & Electric 1st Pf'd	24¾	27½		
Penn Gas & Elect Class A Pf'd	19	23		
Puget Sound P. L.	28	38¾		
7% Pf'd	103½	113¾		
Southern Power & Light Com	29½	46	40⅝	68⅞
Com. Voting to Ctf	28	43⅝	40⅜	65⅛
$7 Pf'd	101¾	110⅜	108½	110½
Participating Pf'd	67⅛	91		
Standard Gas & El. 7% Pf'd	104	112		
United Gas Impt	89	119	111¼	174½
United Light & Power Com A	12⅛	15¾	13¾	33⅞
Pf'd Class A	85	97⅜		
Pf'd Class B	50¼	57		

Los Angeles Stock Exchange

	1927 Low	1927 High
L. A. Gas & Electric Pf'd	104½	112¾
Pacific Light Com	72	95½
So. California Ga. 6% Pf'd	25⅛	28

San Francisco Stock Exchange

	1927 Low	1927 High
Pacific Gas & Electric Comm	43⅞	55½
1st Pf'd	26⅛	29¼

EXTRA DIVIDENDS, ETC., PAID IN 1928 BY GAS COMPANIES

American Gas & Electric Class A extra	25c Feb. 1.
Railway & Light Securities 1 Common extra	$2.00 Feb. 1.
Union Natural Gas	5c Feb. 1.

Pennsylvania Gas & Electric Common	3¼c Mar. 1.
Commonwealth Power, Common	50c May 1.
American Power & Light Common	1/50 share common stock Sept. 1.
American Power & Light Common	1/50 share common stock Dec. 1.
Federal Light & Traction Common	15c payable in com stock
American Gas & Electric Common	1/50 share of com stock
Consolidated Gas Utilities Class a	1st Dividend of 33c on stock Sept. 1.
Gas & Electric Securities Common	75c payable in com stock Oct. 1.
Wisconsin Power & Light 6% Pf'd	1st Dividend Oct. 15, $1½
American Light & Traction Common	$2 payable Nov. 1 Extra
Engineers Public Service Common	1st Dividend 25c Payable Jan. 2, 1928
United Gas Supt.	50c Payable Dec. 31st.
American Power & Light Common	5/50 share of com stock Dec. 1.
Associated Gas & Electric $5 Pf'd	1st dividend of $1.25 on new stock Dec. 15.
Public Service Corp. of N. J. Common	40c Payable Dec. 31.

SUMMARY OF SECURITIES ISSUED BY PRINCIPAL GAS COMPANIES IN 1928

Name of Company	Name of Security	Price	Yield %	Purpose	Amount
Consolidated Gas E. L. & P. Co.	5% Cumulative pfd. stock Series A	100 & accrued div.	5%	Refunding & additions	10,000,000
Continental Gas & Elec. Co.	5% Gold Debentures Series A	95 & int.	5.30%	Refunding & additions	36,000,000
Cities Service Gas Pipeline Co.	1st Mtge Pipeline 6% Gold Bonds	100 & int.	6%	New Pipeline & additions	12,000,000
Southern Counties Gas Co. (California)	1st Mtge 4½% Gold Bonds	94¾ & int.	4.80%	Refunding	12,000,000
Pacific Gas & Electric Co.	1st & Refunding Mtge Gold Bond Series E	99 & int.	4.56%	Refunding	20,000,000
Oklahoma Natural Gas Co.	6½% Cumulative Pfd. stock	99½ & div.	6.53%	Acquisition	7,500,000
Scranton Gas & Water Co.	1st Mtge 4½% Gold Bonds	99 & int.	4.56%	Corp Purp.	11,000,000
Public Service Corp., N. J.	4½ Convertible Gold Debentures	100	4.50%	Refunding	43,689,000
American Gas & Electric Co.	5% Gold Debentures	101 & int.	4.95%	Refunding	50,000,000
Cincinnati Gas & Electric Co.	Gold Bonds 1st Mtge 4% Series A	92½ & int.	4.40%	Acquisitions	35,000,000
Associated Gas & Electric Co.	4½% Convertible Debentures	97		Refunding & Acquisition	63,000,000
Cities Service Co.	5% Gold Debentures	98 & int.	5.13%	Refunding	50,000,000
American Gas & Power Co.	5% Gold Bond Debentures	95½ & int.	5.30%	Refunding	6,500,000
Southern Cities Utilities Co.	1st Lien & Collateral Trust 5s A	94	5.40%	Refunding & Acquisitions	10,500,000
Consolidated Gas Utilities Co. (Del.)	1st Mtge & Coll. 6s A	98½	6.15%	Acquisitions & Construction	8,000,000
Public Service of N. J.	$5 Preferred Stock	98	5.10%	General Corporate purposes	$28,016,926 (285,887 shares)
Standard Gas & Electric Co.	$4 Cumulative pf'd stock	66	—	General Corporate purposes	$8,670,420 (131,370 shares)
Midland Utilities Co.	Debenture 6s	99½	6.05%	Development of Subsidiaries	$6,000,000
Middle West Utilities	Notes 5½	100	5⅝-6%	Development of Subsidiaries	$30,000,000
Cities Service	$5 Cumulative pfd.	93½	5.34%	Retire pf'd $7 & 6 pf'd stock	$4,675,000 (50,000 shares)
Memphis Natural Gas	1st Mtge 6s	99½	6.05%	Acquisitions & Construction	$6,300,000
Engineers Public Service Co.	$5 Cumulative pfd.	99½	5.52%	Acquisition	$12,935,000 (130,000 shares)

Selling Industrial Gas

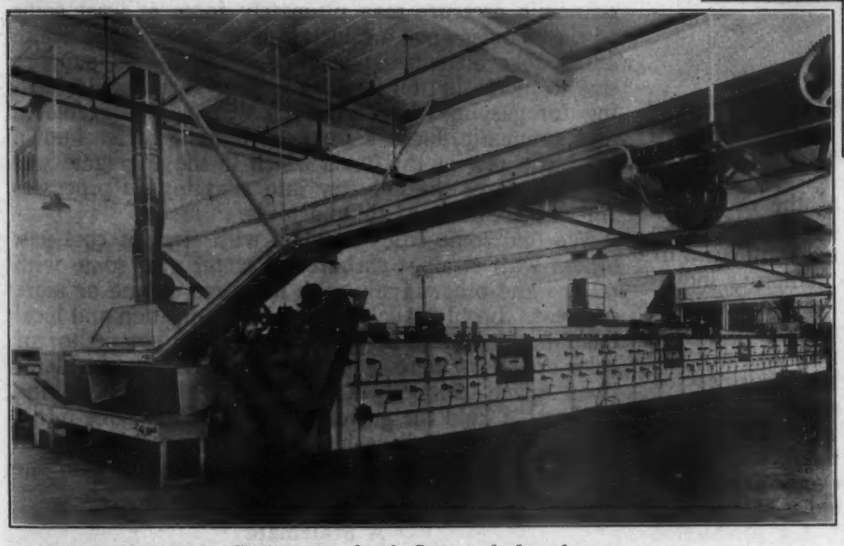
Baking Bread Better

WARD Baking Company in Baltimore does it "better with gas" as is evidenced by the accompanying illustration of their hundred foot long Comstock oven.

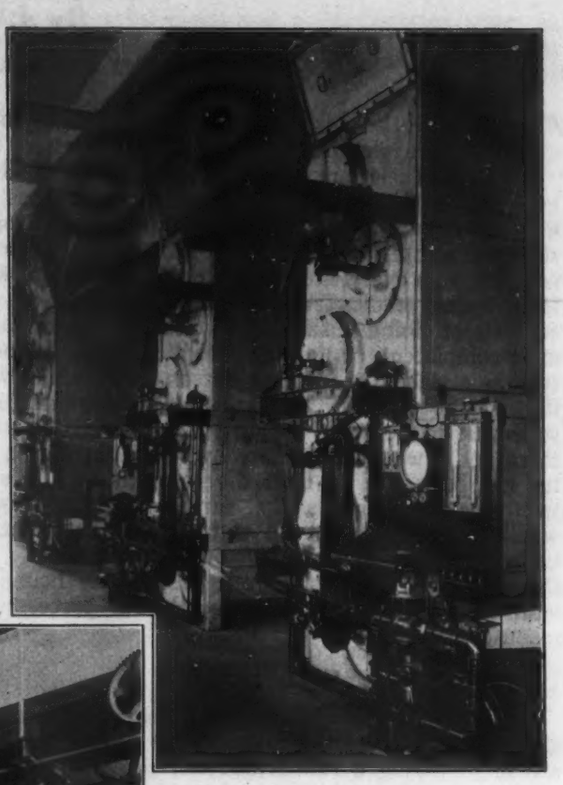
This oven is of the standard sectional construction, built of metal with efficient insulation. It has a capacity of 4000 one pound loaves of bread per hour and the gas consumption gives slightly better than one cubic foot per pound of bread baked.

The oven is made up of five foot sections to facilitate erection and each section is vented to a common flue. The burners of several of the sections are connected together to form independent groups of burners, each group being controlled by thermostats. This burner arrangement may be seen in the illustration.

The unloading end is shown and the bread is conveyed to a large cooling room. Overhead may be seen a conveyor for removing the empty pans to the loading end of the oven. Expansion is taken care of by anchoring the unloading end and allowing the loading end to remain free to move.



Delivery end of Comstock bread oven.



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A careful searching out of all the hidden places, more comprehensive than a survey, and which considers all the factors from choice of site, process, as well as distribution methods, to actual cost of service is essential. Such a detailed study must obviously be made for each local situation and in this connection generalizations are particularly dangerous and misleading.

Such a study made in connection with an equally careful and detailed analysis of production and distribution costs, must lead to certain definite conclusions, some of the more important being:

1. There is much prospective commercial, industrial, and central house heating business available to the gas industry which cannot be secured until the cost of such gas service more closely approaches the cost of other competitive service.
2. Disregarding cost differential for the moment, and assuming it were possible to attach the greater part of such business to our lines, plant and distribution system load demands would require an entirely new physical set-up. Seasonal peaks create complementary valleys, and interest charges on plant to meet the peak load demand *must* be earned from the rates. Conversely the rates must be low enough, on the average, to successfully meet the competition of other fuels already mentioned.

The foregoing are but two factors, and there are many others, which must be considered by the industry. We may approach the solution of the problem in one of two ways, the first being to set our house in order and make the changes of our own volition, and from within, to support an aggressive selling campaign. The second is somewhat like unto the first except that economic pressure may ultimately force at least some of the changes upon a reluctant industry. Public health and smoke abatement; possible decreased oil supplies due to increasing oil uses, as well as further oil cracking for gasoline; house heating demands as regulated and automatic dustless furnaces become better known are but a few of the items which in the aggregate will serve to force the industry into adapting its processes for at least some of this business.

We find some cities supplied with straight coal gas, others with straight carburetted water gas, some with oil gas and others again with mixtures of one or more of these. Local available fuels, transportation and local labor problems and low priced coal as a competitor of coke doubtless were some of the economic considerations which dictated the choice of the gas making method. I hold the gas engineer second to none in his adaptability, as well as his ability to keep his costs to the lowest possible minimum, in connection with the equipment committed to his charge.

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He has rarely, however, been required to meet sudden and enormous demands upon his production and distribution systems by the activities of an aggressive sales corps. The salesman has encountered the competition already referred to and the result, generally speaking, with the exception of normal growth, has been stalemate. These two then must get together and evolve the proper production system.

As Mr. Frank W. Steere, so aptly puts it, the ultimate decision as to the most suitable equipment for gas making is a matter of judgment, foresight, analysis of local conditions and business instinct. Referring to comparisons as between the total cost of gas production when made by different processes he reminds us that not only must all carrying charges be included but also the proper return (8 percent) upon the investment. He further points out that comparison be-

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Pennsylvania Gas & Electric Common	3¾c Mar. 1.
Commonwealth Power, Common	50c May 1.
American Power & Light Common	1/50 share common stock Sept. 1.
American Power & Light Common	1/50 share common stock Dec. 1.
Federal Light & Traction Common	15c payable in com stock
American Gas & Electric Common	1/50 share of com stock
Consolidated Gas Utilities Class a	1st Dividend of 33c on stock Sept. 1.
Gas & Electric Securities Common	75c payable in com stock Oct. 1.
Wisconsin Power & Light 6% Pf'd	1st Dividend Oct. 15, $1½
American Light & Traction Common	$2 payable Nov. 1 Extra
Engineers Public Service Common	1st Dividend 25c Payable Jan. 2, 1928
United Gas Supt.	50c Payable Dec. 31st.
American Power & Light Common	5/50 share of com stock Dec. 1.
Associated Gas & Electric $5 Pf'd	1st dividend of $1.25 on new stock Dec. 15.
Public Service Corp. of N. J. Common	40c Payable Dec. 31.

SUMMARY OF SECURITIES ISSUED BY PRINCIPAL GAS COMPANIES IN 1928

Name of Company	Name of Security	Price	Yield %	Purpose	Amount
Consolidated Gas E. L. & P. Co.	5% Cumulative pfd. stock Series A	100 & accrued div.	5%	Refunding & additions	10,000,000
Continental Gas & Elec. Co.	5% Gold Debentures Series A	95 & int.	5.30%	Refunding & additions	36,000,000
Cities Service Gas Pipeline Co.	1st Mtge Pipeline 6% Gold Bonds	100 & int.	6%	New Pipeline & additions	12,000,000
Southern Counties Gas Co. (California)	1st Mtge 4½% Gold Bonds	94¾ & int.	4.80%	Refunding	12,000,000
Pacific Gas & Electric Co.	1st & Refunding Mtge Gold Bond Series E	99 & int.	4.56%	Refunding	20,000,000
Oklahoma Natural Gas Co.	6½% Cumulative Pfd. stock	99½ & div.	6.53%	Acquisition	7,500,000
Scranton Gas & Water Co.	1st Mtge 4½% Gold Bonds	99 & int.	4.56%	Corp Purp.	11,000,000
Public Service Corp., N. J.	4½ Convertible Gold Debentures	100	4.50%	Refunding	43,689,000
American Gas & Electric Co.	5% Gold Debentures	101 & int.	4.95%	Refunding	50,000,000
Cincinnati Gas & Electric Co.	Gold Bonds 1st Mtge 4% Series A	92½ & int.	4.40%	Acquisitions	35,000,000
Associated Gas & Electric Co.	4½% Convertible Debentures	97		Refunding & Acquisition	63,000,000
Cities Service Co.	5% Gold Debentures	98 & int.	5.13%	Refunding	50,000,000
American Gas & Power Co.	5% Gold Bond Debentures	95½ & int.	5.30%	Refunding	6,500,000
Southern Cities Utilities Co.	1st Lien & Collateral Trust 5s A	94	5.40%	Refunding & Acquisitions	10,500,000
Consolidated Gas Utilities Co. (Del.)	1st Mtge & Coll. 6s A	98½	6.15%	Acquisitions & Construction	8,000,000
Public Service of N. J.	$5 Preferred Stock	98	5.10%	General Corporate purposes	$28,016,926 (285,887 shares)
Standard Gas & Electric Co.	$4 Cumulative pf'd stock	66	—	General Corporate purposes	$8,670,420 (131,370 shares)
Midland Utilities Co.	Debenture 6s	99½	6.05%	Development of Subsidiaries	$6,000,000
Middle West Utilities	Notes 5½	100	5⅝-6%	Development of Subsidiaries	$30,000,000
Cities Service	$5 Cumulative pfd.	93½	5.34%	Retire pf'd $7 & 6 pf'd stock	$4,675,000 (50,000 shares)
Memphis Natural Gas	1st Mtge 6s	99½	6.05%	Acquisitions & Construction	$6,300,000
Engineers Public Service Co.	$5 Cumulative pfd.	99½	5.52%	Acquisition	$12,935,000 (130,000 shares)

Selling Industrial Gas

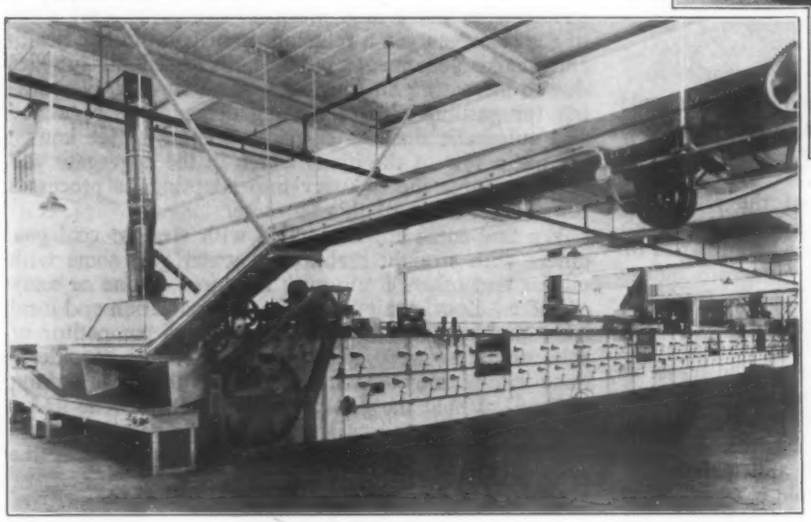
Baking Bread Better

WARD Baking Company in Baltimore does it "better with gas" as is evidenced by the accompanying illustration of their hundred foot long Comstock oven.

This oven is of the standard sectional construction, built of metal with efficient insulation. It has a capacity of 4000 one pound loaves of bread per hour and the gas consumption gives slightly better than one cubic foot per pound of bread baked.

The oven is made up of five foot sections to facilitate erection and each section is vented to a common flue. The burners of several of the sections are connected together to form independent groups of burners, each group being controlled by thermostats. This burner arrangement may be seen in the illustration.

The unloading end is shown and the bread is conveyed to a large cooling room. Overhead may be seen a conveyor for removing the empty pans to the loading end of the oven. Expansion is taken care of by anchoring the unloading end and allowing the loading end to remain free to move.



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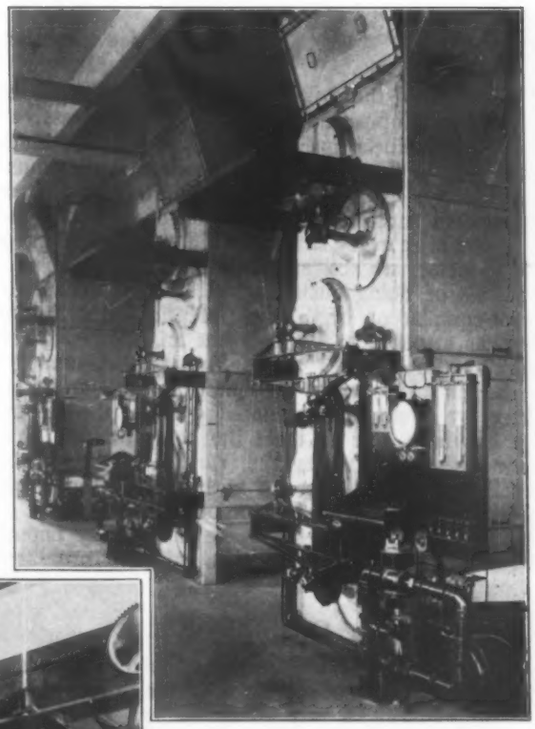

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tween different processes which fails to completely reflect the differences in investment costs is not only valueless but misleading.

The following observations by Mr. Steere are well worthy of repetition:

"The great opportunities in business do not come as the result of revolutionary discoveries but rather by being able to recognize when economic conditions have changed so that the methods that were unprofitable yesterday become profitable today."

"Improved load factor offers the greatest opportunity for a reduction in the cost of gas."

"A gas company turning over its capital once in five years can never expect to become a material factor in furnishing fuel to industries which turn their capital over four or five times in one year."

At the 1925 Convention of the American Gas Association, Mr. J. A. Perry ably discussed "Types of Plants and Quality of Gas Best Suited for the Development of the Industry," in which he noted the following:

(1) The large increase in recent years of construction costs for public utility improvements.

(2) The great fluctuations in the cost of oil.

(3) The possibility of large demands created by house heating customers.

With these three important considerations in mind Mr. Perry asks whether, under present conditions, we are to face new and more economical processes which will scrap our present plants; or whether we can economically and satisfactorily fit our present types of production equipment in with future processes of gas manufacture which may later be developed or which are now in their preliminary experimental stages.

The requirements for the base gas used throughout all seasons of the year will largely be controlled by available "raw materials of which the major portion is likely to maintain at a uniform as well as a low cost throughout the year". The requirements for the peak load gas are instant availability for the production of large volumes on short notice, with the lowest possible carrying charges on the necessary investment.

In concluding his paper Mr. Perry states that in order "to satisfactorily handle and economically develop the gas business with our existing perfected types of gas manufacturing apparatus we need heating value standards at least as low as 440 B. t. u. and possibly as low as 400 B. t. u." With this as a start, Mr. Perry believes we can then, as new developments and other processes become available, shape and direct plant extensions to make the most advantageous combination in the light of the then prevailing conditions.

Stein and Willien's Findings

Last year Messrs. Stein and Willien won the Beal Medal with their contribution to the industry in the joint paper entitled "Developments in Water Gas as Operation." The specific example quoted was a district of supply requiring 7¾ million cubic feet at a daily average, peak days exceeding 10 million, and a base load of coal gas from coke ovens varying between 5½ and 6½ million cubic feet daily (according to the season) the balance being made up by carburetted water gas. Due, however, to plant and distribution system layout it was necessary to furnish straight coal gas to half of the territory served. The remainder was furnished gas of varying mixtures and consequently of varying specific gravity. The attendant difficulties in utilization required improved service in the mixed gas district, and we learn that after setting up what might be called an engineer's balance sheet to evaluate the economics of the local situation, some original research was undertaken.

The successful result was a "carburetted water gas having a specific gravity low enough to burn satisfactorily in appliances adjusted for straight, coal gas in the mixed gas area."

Another very recent contribution to this interesting subject was the paper "Commercial Propane and Butanes in the Manufactured Gas Industry" presented in October last by Messrs. R. W. Thomas and O. M. Setrum before the Technical Section of the American Gas Association. As is doubtless well known, propane and butane are rich hydrocarbons obtained from "casing head gasoline" or more correctly "natural gas gasoline," gases under normal conditions, and for convenience in handling, stored under pressure to retain them in a liquid state. Propane has a heating value of 2,550 B. t. u. per cubic foot and butane 3,200 B. t. u. per cubic foot.

Suggested Applications

Among the suggested applications of these products to the manufactured gas industry are two of special import to the production engineer. The first is for carburetting gases of little or no calorific value and the second is for reforming or cracking high calorific value liquefied petroleum gas vapors to produce low density gaseous fuel of the desired B. t. u. content. The conclusions arrived at by the authors contain the following significant statements:

1. Commercial butane at present oil prices can successfully compete for use as a water gas enricher.

2. Serious consideration should be given by the gas industry, to the use of these liquid gases as the sole raw material for gas manufacture.

Turning again to bituminous coal we should briefly consider low temperature carbonization.

The fundamental economics of high and low temperature carbonization seem to me to be about as follows: The prime purpose of coal carbonization as practiced by the gas industry today is to obtain gas, the by-products being incidental to the process. When properly handled they may be commercially exploited as a source of revenue. In low temperature carbonization the gas is not the chief aim of the process. Low temperature carbonization had its genesis in Europe where open fires in the home are used to an enormous extent and where central house-heating is rare. A free burning fuel is essential, and because of heavy smoke palls the question of smoke abatement has been uppermost for many years.

The solid residue, a high volatile, freely burning coke, is the principal product of low temperature carbonization, and it may be prepared from low grades of bituminous coal otherwise unusable. As such, there is a market, under the conditions described, and there is another market for its use commercially and industrially, especially where anthracite is unknown or too expensive when transported from far distant mines. A relatively small quantity of very rich gas, (that is rich in heating value) and oils useful for internal combustion engines are also produced.

Low temperature carbonization has been practiced experimentally in the United States and other countries

for many years and at present there are a few plants operating on a large scale. The developments of the latter are being watched with the keenest interest by the manufactured gas industry; this method of carbonization assuredly has its place in coal conversion and undoubtedly will be used more at time goes on. At present, however, as far as the gas industry is concerned, it is largely in its experimental stage. Some of the reasons for this are that light oils and fuels for internal combustion motors are plentiful in the United States and furthermore, there is not a ready market for the coke produced.

Among the more important matters to be decided in connection with low temperature carbonization are the general economics of this process as compared with carbonization methods employed in the gas industry today. Low temperature carbonization means low gas and high tar or oil yields, products of a different character from those handled today and requiring an entirely new "set-up" of the industry to produce and dispose of.

It may well be asked what will be the result of mixing gases of different characteristics, particularly in connection with distribution and utilization requirements. I think the answer is that the matter may safely be left with the practical activities, at the Cleveland Laboratory of the A. G. A., of the Mixed Gas Research Committee. Thousands of tests are being made with varying mixtures of all conceivable combinations. Out of this research we may confidently expect to learn the underlying fundamentals and their practical application.

In this review we have examined the history of the manufactured gas industry and analyzed its statistics and speaking of statistics, Richard T. Ely, Professor of Economics at the University of Wisconsin, once observed:

> "Statistical method aims primarily to study mass phenomena in their quantitative relations. As applied in economics it makes use of the earlier analytical quantitative conclusions, verifies and traces them historically, and then aims to project them into the future with the view of establishing trends in development that may serve as a guide in reaching conclusions. It is here that new fields for research lie."

All this is precisely what the gas industry has done, to some extent. But the study must be pushed to its logical conclusion, the facts verified beyond the shadow of a doubt, and then applied practically to meet the present situation.

It would seem there is little disagreement as to the need of a base load process with flexible auxiliary peak load equipment. But regarding the fuels or the actual production method which should be employed local conditions will largely control.

We have seen there are a number of tried and proven gas making methods now available and in every day use the economies obtained are great and the efficiencies are amazingly high. It would further seem that the time has come for the same industry which developed such highly efficient and adaptable methods to meet changing conditions of both production and utilization, to call a halt. Let the production and sales departments get together and develop, with the same ingenuity as before, processes designed from the strictly commercial point of view. Let us have gas manufacturing methods definitely planned to make possible the attachment to the lines of the industry domestic, commercial, and industrial business impossible under present cost conditions.

Such a combination will prove invincible. It should go far toward hastening the time when gas will attain its logical and inevitable goal, that of furnishing heat for the greater part of the world's domestic and industrial requirements. I would not have it appear that these remarks, in view of the immensity and importance of the subject, necessarily of a somewhat general nature are to be construed as a sweeping indictment of the gas industry. On the contrary I believe there is no finer monument to its engineers than the modern and so highly efficient manufacturing plants.

But I would urge that we borrow the spectacles of the sales forces for a while; that we see, as through their eyes, some of the economic factors which limit substantially greater expansion. With our highly successful background and a record of overcoming all engineering and economic obstacles it should, and will, prove a relatively easy matter to meet the service requirements of tomorrow.

CARBON BLACK PRODUCED FROM NATURAL GAS

A new record for the production of carbon black in the United States was established in 1927 by a total output for the year of 198,429,000 pounds—an increase over 1926 of 17,853,000 pounds, or 10 per cent. The production had a value at the plants of $10,955,000, or an average of 5.5 cents per pound, the same average as in 1926.

The year 1927 witnessed a material expansion of both domestic and foreign trade in carbon black. Total sales amounted to 223,430,000 pounds, an increase over the previous year of 33.4 per cent; of these sales, 168,999,000 pounds was consigned to domestic consumers and 54,431,000 pounds was exported. The brisk demand for carbon black had a material influence on stocks held at plants which for the first time since statistics of stocks were compiled (1922), showed a decrease from 108,378,000 pounds on December 31, 1926, to 82,831,000 pounds on December 31, 1927. In spite of the increased production, losses at the plants again showed a decrease—a probable reflection of increased efficiency in handling.

PRODUCTION BY STATES

Carbon black produced from natural gas in the United States, 1926–27, by States

State	Producers reporting	Number of plants	Pounds	Value at plant		Estimated quantity of natural gas used	Average yield per M cubic feet
				Total	Average		
1926					Cents	*M cubic ft.*	*Pounds*
Louisiana	22	34	130,276,987	$6,965,771	5.3	98,066,000	1.3
Texas	8	19	36,328,052	2,132,424	5.9	21,360,209	1.7
Kentucky	2	3	6,309,826	322,642	5.1	3,124,000	2.0
West Virginia	6	10	5,804,586	312,712	5.2	2,586,000	1.5
Wyoming	1	1	} 3,750,425	215,551	5.7	3,535,560	1.1
Montana	2	2					
Pennsylvania	1	1					
Colorado	1	1	300	21	7.0	240	1.3
	[1] 23	62	183,570,176	9,909,221	5.5	130,321,000	1.4
1927							
Louisiana	21	34	124,185,000	6,460,000	5.4	95,150,000	1.3
Texas	10	13	56,256,000	3,200,000	5.8	35,495,000	1.6
Wyoming	2	2	6,294,000	282,000	5.9	4,294,000	1.4
Kentucky	2	3	5,992,000	247,000	4.4	3,187,000	1.8
West Virginia	5	6	2,795,000	207,000	7.4	1,921,000	1.5
Montana	2	2	2,198,000	136,000	5.9	2,048,000	1.0
Utah	1	1	978,000	40,000	5.0	891,000	1.1
	[1] 33	61	198,439,000	10,955,000	5.5	144,987,000	1.4

[1] In counting the total number of producers, a producer operating in more than one State is counted only once.

—*U. S. Department of Commerce, Bureau of Mines.*

Control of Dust in Water-Gas Sets

Reasonable Sizes Cyclone-Type Dust Catcher Found Effective and Convenient

By W. I. Battin

United Engineers and Constructors, Inc.

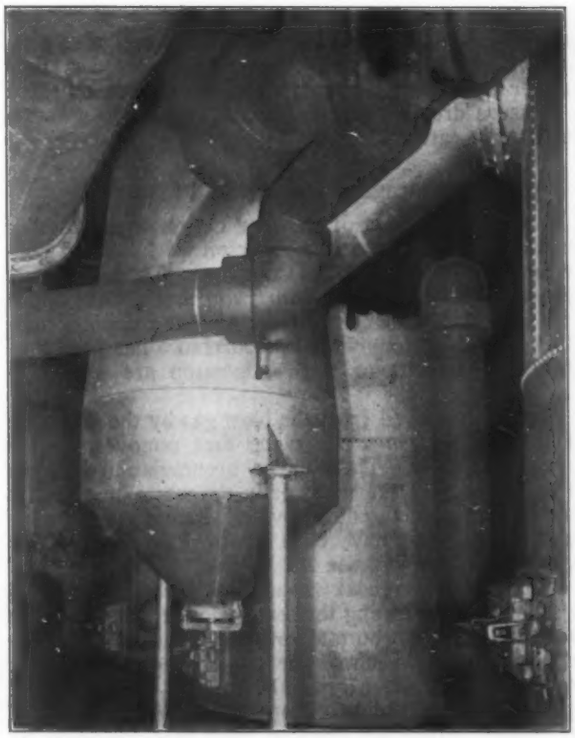
SOME form of dust catcher between generator and carburettor is commonly installed in water-gas sets to prevent blown-over fuel from fouling checker brick and accumulating in connections and bottoms of generating equipment. Without such elimination of dust the oil efficiencies are impaired and frequent renewals of carburettor checker brick are required.

With empty-carburettor systems using the nebulizing oil spray the blown-over fuel, unless controlled by effective dust catcher, accumulates in the bottom of the carburettor and soaks up oil. This results not only in decreased oil efficiency, but also produces a deposit cemented together on the bottom of the machine the removal of which is a hot, dirty, and expensive operation. Hence, in either checkered or uncheckered machines dust control has been recognized as important, not only to improve operating efficiency, but also to lower cleaning and maintenance costs.

An Ineffective Solution

To avoid these objectionable conditions some plants have installed between the generator and the carburettor dust-catcher shells which are almost as large as the carburettor itself. Although these units are effective they are too large for convenient operation. They introduce the specific difficulty of increased purging time on each run or an increased content of inerts in the gas. They also add greatly to the cost of building the set and to the ground space necessary for it.

In view of these disadvantages with the large dust-catching units, the U. G. I. Contracting Company Division of United Engineers and Constructors, Inc., decided to experiment with various forms of smaller devices for this work. It was recognized that the high temperature and the erosive action of dust particles on refractory linings when impinging at high velocity precluded the use of baffles or similar complicated devices. It was also recognized that the pressure drop through the dust catcher should be made a minimum, certainly not appreciably greater than is the case with the customary standard unit. It was deemed desirable to keep the design of any apparatus proposed for this use such that it could be installed not alone on new equipment, but also on sets already in use.



Cyclone-type dust catcher in position

Several types of experimental units of light sheet steel were built, including standard tee-and-elbow and bootleg types. The shape and dimensions of such experimental apparatus were made the same as was anticipated for the inside of the firebrick lined units of commercial sort. For test purposes a size of apparatus was chosen approximately one-half that which would be standard for an 11-foot water-gas jet. Seventeen types of experimental dust catchers as proposed by different engineers were tried out.

To test these experimental unit devices weighed quantities of dust of the character commonly blown over from a generator were fed through them. The air carrying this dust was supplied in measured quantities from a large high-pressure fan. The velocity of the air was kept the same as that which would prevail in the blast gases in a standard set, allowance being made for the high temperature, density of the gas, etc. The amount of dust trapped by each dust catcher was weighed and the efficiency of dust removal calculated. Sieve tests were made on the dust as introduced and as collected, in order to determine the influence of size of particle.

The efficiency of the "standard" type of dust catcher was found to be 48 per cent and the loss in pressure through it was 2.3 inches of water with normal rate of blast. The first results on cyclone-type units showed an efficiency of 95 per cent in dust removal, but the pressure loss was 19 inches of water when the gas velocity was sufficient to provide for this high percentage of dust removal. Such pressure drop was obviously prohibitive.

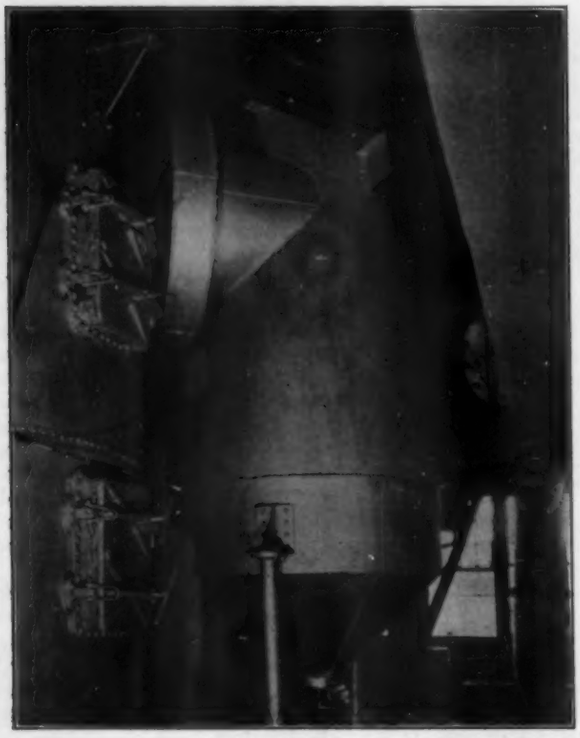
Further experiments, however, developed certain facts which suggested certain changes in design as a result of which ultimately there was evolved a dust catcher having an efficiency of about 93 per cent and a pressure drop no greater than that through a "standard" dust catcher.

Encouraging Results in Practice

Two dust catchers of the new design were installed on two 10.5-foot sets at the Paterson works of the Public Service Electric and Gas Company. These sets have been operated in parallel with two other sets equipped with the "standard" dust catcher so that a definite comparison of their commercial performance has been possible. The results of this comparison are extremely encouraging.

Material removed from the blast gas by the new type of dust catcher is about twice that removed by the "standard" units. There is no accumulation of dust in the bottoms of the shells or in the waste-heat boilers on the sets using the new device, whereas considerable quantities of dust have been removed from the other standard sets.

Since bituminous coal was used as the generator fuel in all of the sets during the test period it was necessary to rechecker the carburettor of the "standard" sets frequently. Examination of the sets having cyclone dust arresters was made after 500 hours of operation and again after 1500 hours of operation. At the end of the longer period the checker brick was found to be practically as clean as when the set was started up. There has thus far been no evidence of erosion of the fire-brick lining with the new type of dust catcher or of connections to it. From a practical stand point the new device appears to have an operating efficiency of substantially 100 per cent. By comparison with previous forms it is clearly shown by screen test to retain a very much larger part of the finest material.



View of dust catcher showing method of connecting to gas making apparatus

As the result of the operation of these machines the Public Service Electric and Gas Company decided to install the new type of dust catcher on the U.G.I. mechanical generating units now being erected in its Camden plant. Coke will be used at this Camden works, which means that the dust catcher will probably be able to retain all but the very finest of dust particles. It is believed that so little material will escape from the set that no dust catcher will be required on the stack.

The advantages anticipated from the new equipment include those of reduced cost for dust removal from the shells and the prolonged interval between rechecker-ings. Assuming only two less rechecker-ings of the carburettor per year, including the cost of heating up the set and getting it back to normal operating conditions, the saving will amount annually to at least 15 per cent of the cost of the dust catcher. The increased operating efficiency through better oil results obtainable only with clean checker brick is "anybody's guess"; but if the advantage amounts to as little as 0.05 gallon of oil per M., the dust catcher will even then pay for itself in less than a year by this saving alone. As a matter of fact, the benefit in oil efficiencies is expected to be larger than this.

The new form of dust catcher is illustrated in its experimental form by the two photographs which accompany this article. It is of interest to note that this new equipment can be installed on any existing sets which now have the "standard" tee, elbow, and bootleg type of dust catcher, if desired.

ANALYSIS OF OIL-FIELD WATERS

By means of water analysis it is often possible to determine the source of infiltrating water in petroleum and natural-gas wells. If the water from each sand encountered during drilling is analyzed, later water trouble can frequently be located by comparing the analysis of the infiltrating water with the analyses previously made. Inasmuch as many methods of analysis and several systems of computing and expressing results are in use, the reports of different analysts on the same water may show wide apparent divergence and cause much confusion in the minds of those attempting to make use of chemists' figures.

The need of greater uniformity in the methods of analyzing oil-field waters as well as in presentation of results has led to the publication by the United States Bureau of Mines of Technical Paper 432, which presents the methods used by the Bureau for the estimation of characteristic constituents of oil-field waters and for calculating and reporting results. The interpretation of water analyses of terms of oil-field practice has been covered in Technical Paper 404, previously issued.

Four steps of equal importance are involved in obtaining reliable results from water analysis: Collection of samples; preliminary treatment and examination before making the analysis; actual chemical analysis; and computation and presentation of results. Each of these subjects is discussed in Technical Paper 432, "A System of Analysis for Oil-Field Waters," by E. C. Reistle, Jr., and E. C. Lane, copies of which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. at a price of 5 cents.

A Service Catechism

Anyone who will thoughtfully study these questions and conscientiously answer them to himself cannot fail to become a better gas man.—Editor.

NOT long ago the Bureau of Standards began the collection of data for the preparation of a new edition of Circular No. 32, "Standards for Gas Service," and in connection with the undertaking asked each state commission to submit questions which it would like to have discussed, the questions to be referred back to the commissions and to the gas industry for such discussion. The number of questions submitted was greater than was anticipated.

Although some commissions have not been heard from, the list of questions received, somewhat revised to eliminate duplication and with a few additions by the Bureau, are being submitted for discussion at this time. One or two of the questions have been brought to the Bureau directly by gas companies.

The Bureau hopes that the fullest discussion of these questions will be given. Numerical data, and statements regarding satisfactory or unsatisfactory experiences with one or another form of requirement are particularly desired. The sources of data and opinions will be regarded as confidential if the sender wishes.

Heating Value

1. Is a state-wide heating value standard desirable? If not, how should local heating value standards be determined?

2. What is the purpose of a uniform heating value standard?

3. What exceptions should be allowed to a uniform heating value standard?

4. What restrictions should be made, if a selective standard is allowed?

5. What evidence should be required to justify the standard which a company selects?

6. What variation in heating value should be allowed?

7. Can the British "Therm Law" be adapted to American practice and regulation?

The essential feature of the British practice referred to is that the rate charged for gas is fixed at so much per heat unit. The utility is allowed to supply the heat units by whatever methods economic conditions and engineering judgment dictate. This practice has long seemed desirable to the Bureau. All reasons for not adopting such a policy are therefore particularly desired.

8. What heating value of gas should a gas utility be required to maintain to allow economical operation of utilization equipment?

9. Should there be a different heating value standard for long distance, high pressure, interurban distribution systems, than there is for urban, low pressure systems? If so, which standard should apply to urban high pressure systems?

10. Should local heating value standards be determined at the center of distribution or at the plant? If determined at the plant, what limits should be established controlling the Btu drop at the center of distribution for gas served at low pressure and high pressure?

11. Having determined the economical heating value at gas plant, for low pressure service, would a change in this heating value requirement be desirable if distribution is changed over to high pressure system?

12. Is any heating value provision necessary or desirable for natural gas?

Practically this question has arisen several times in various parts of the country, and the problems presented have been unusually difficult. Consider the following cases:

(a) A utility formerly selling natural gas as it comes from the wells begins extracting first gasoline, then butane, propane and finally ethane which is delivered to industrial consumers in cities in competition with manufactured gas. The volume taken from the natural gas is almost negligible and the reduced heating value causes increased demand. If no restriction is placed on the gas company, it not only obtains these products for the cost of extraction, but is paid a premium in the form of increased returns from its natural gas customers. The fuels extracted are of more value as liquids than in the gas; and probably they should be extracted in the interests of conservation.

(b) A utility supplements its supply of natural gas with manufactured gas of lower heating value but greater cost, at the same time preventing hardship to its customers, and receiving an increased return because of the larger volume required. The increased volume sold may or may not pay for the cost of supplying the manufactured gas.

(c) A utility supplied with gas from an oil field finds its supply contaminated by air or flue gases pumped into the oil wells to force out oil.

13. How should an "average heating value" be determined?

14. Should all utilities be required to operate a calorimeter? If not, where should the line be drawn?

15. Should a company that serves several large communities be required to operate a calorimeter at each community?

16. What apparatus other than the Junkers type of calorimeter is considered reliable for testing the heating value of gas?

17. Should the commission require a definite minimum degree of accuracy for the utilities' determinations of heating value, as it does for the utilities' meter testing? If so, what should this be for all utilities?

18. How much calorimeter testing should a commission require?

19. In some localities where high pressure distribution systems are used, the gas is delivered to the consumer in a dehydrated or somewhat unsaturated condition. A calorimeter wet meter adds a diluting inert gas (water vapor) to an unsaturated gas and reduces the heating value of the gas. Even though this

is a small amount (about 2% at the most) what is the best method of determining the correct heating value?

20. Could some other liquid be used in a colorimeter wet meter that would be comparatively non-volatile and would not absorb any appreciable amount of the gas?

Composition of Gas

21. The utilization of gas is affected by variations in (1) Heating value, (2) Pressure, (3) Density, (4) Composition. In considering the variation to be allowed in one of the above what should be assumed for the others, i.e., no variation, allowable variation, average variation that might occur with good practice, maximum variation? For example, a variation of plus or minus five per cent in heating value might be allowable if pressures and density were constant, but might cause considerable trouble or the effect might be neutralized if the changes were accompanied by changes in pressure and density.

22. Under what conditions is it desirable to permit a natural gas company to supplement its supply by mixing with manufactured gas? What variation in composition is permissible in such a case?

23. Is a limitation as to variations in composition or specific gravity desirable, heating value remaining constant?

24. What should be the maximum per cent of inerts permitted in gas supplied to consumers?

This question should be considered as much with respect to economical production and distribution as to utilization. The possibility of setting different limits for different gas-making processes should be considered.

25. Are the present limitations (which are nearly uniform among all states) on the sulphur content of gas satisfactory?

Pressure

26. Are both maximum pressure limit and a limit on pressure variation desirable on a low pressure distribution system? If so, what maximum limit should be set for manufactured gas? For natural gas?

27. What variation in pressure should be allowed?

28. If a rule limiting pressure variations at any one place to 100 per cent of the minimum, or a similar rule, is in effect, should a limit also be placed upon the difference between pressures in different parts of the same city?

The limitation of pressure variations at any one place is necessary to permit appliances to operate satisfactorily without readjustment. Many appliances (e.g. one of the most extensively sold radiant heaters) are sold with fixed adjustments, and are not adjusted after installation. In such a case the variation of pressure throughout the city is as important as that at any one outlet. Should the service rules which the utility is required to observe be drawn up to take care of such a case as this; is there any other way of dealing with it; or should nothing be done about it?

29. Many commissions require that the pressure shall not vary more than 100 per cent of the minimum during a period of 24 hours. Is there any good reason for not requiring uniformity within the same or slightly wider limits over much longer periods of time?

30. Should a limit, other than that which applies to pressure variations in general, be placed upon momentary or pulsating variations?

31. Except in districts of low saturation (i.e., abnormally long distances between consumers), should the so-called medium pressure system be permitted, keeping in mind the greater unaccounted for gas losses which result from higher distributing pressures under such systems?

32. What form of rule should be adopted by the commission to guarantee good pressure service to the consumers on a high pressure house governor distribution system?

33. What form of pressure surveys should be required on high pressure house-governor distribution systems?

34. What is the most desirable method of making a pressure survey on a high pressure system? A low pressure system?

35. Should all utilities be required to keep a continuous record of the pressure at some point in each of the communities which they serve?

36. Should the commission require the utilities to report interruptions of service?

Meters

37. Should the commission set any limits of accuracy within which meters would be called "legally correct," either for the purpose of placing a limit on adjustments of bills, or for determining who is to pay the fee for referee tests, etc?

38. Since the above limit would only need to apply to fast meters, should the commission set another limit on the error that would be allowed on meters that are returned to service?

39. Should and can a commission require a company to make a rebate for charges that have been based on readings from a fast meter?

40. How should these rebates be computed?

41. What is the purpose of limiting the error on slow meters?

42. What should constitute a complete "meter test"? (i.e., one checked test, one open test, or two checked tests, one open test, etc.)

43. What agreement should be required between the checked and open tests on meters before the meters are allowed to be put into service?

44. Should the commission require that every test consist of two similar runs that agree within ½ of 1 per cent, in order to eliminate personal errors?

45. Should the utilities be required to make the "open" tests on meters before they are adjusted and to keep a record of these tests, or is it sufficient to make the open test only as a check on the "checked" or "normal" test and to know if the valves are properly set?

46. Should the commission require that gas be used instead of air for proving meters?

47. Is a rule requiring the testing of all gas meters once in five years economically justifiable? Would any injustice be imposed on purchasers of gas by the adoption of a seven-year period for the testing of meters? If not five or seven years, what is the best length of period to be required for routine meter testing?

48. Should the commission require a certain amount of maintenance on meters?

49. What factors should be considered and how much weight should be given to each in deciding on a routine meter test period?

50. Should a company which opens and repairs all meters that are brought in for periodic test regardless

of the results of the proof, be allowed a longer period than the company which returns to service all meters which are within the allowable limits of error?

51. Some companies remove and test meters whenever a consumer moves or orders a shut-off; others lock the meter until someone else moves in or orders the gas turned on. In some localities this affects as many as 20 per cent of the meters, and where the former practice is in effect, a large number of meters are tested much more often than the periodic test rule requires. Even though this practice requires unnecessary expense that could be saved by a small additional investment, should the commission allow a company using this practice any longer period than those that lock meters?

52. What is the maximum length of time that a gas meter may be locked in service without its accuracy being affected?

53. Should not the commission allow a longer period to those utilities that maintain their meters exceptionally well, that keep very careful records, and that properly anticipate meter repairs than is required of those that do no more than just conform with the commission's standards for meter testing? In other words, cannot the commission have two standards; one with good maintenance and a long period, the other with limited maintenance and a short period?

54. Should any limitation be made as to the use of prepayment meters? If this class of meters is undesirable in all cases, what provision should be made for forcing the retirement of those in use?

55. Where gas is metered at pressures appreciably above atmospheric, should the meter readings be corrected to atmospheric pressure? Below what meter pressure is such a correction undesirable?

56. What meter testing equipment should the commission require?

Miscellaneous

57. Should the commission take the responsibility for the accuracy of the utilities' meter provers and other testing apparatus rather than merely checking them occasionally and requiring the utilities to maintain a definite degree of accuracy?

58. Should a gas company be required to make periodic inspections and adjustment of appliances?

59. (a) Should a utility be required to adjust or replace burners when changes in service conditions make such adjustments or replacements necessary?

(b) Under what conditions should a utility be required to make adjustments for all customers, and under what conditions should adjustments be made only on complaint?

60. Should special consideration be shown to gas companies which maintain superior service conditions? If so, what should be the nature of the reward, and how should companies be rated to determine whether it is merited?

This question is suggested by the practice of the Illinois Commission in grading gas companies' service, described in the April 1928 issue of the American Gas Journal. While satisfaction is apparently the only reward offered by the Illinois Commission for a good rating, something more tangible is suggested by question 53 submitted by another Commission.

61. Should a utility be permitted or required to refuse business?

(a) For which it does not have adequate facilities?

(b) Of such a character that it is likely to unfavorably affect satisfactory service to other customers?

(c) When the installation of piping or gas-burning equipment is regarded as hazardous or of such character that satisfactiory service cannot be given?

62. What form of rule is desirable with respect to the extension of mains beyond existing systems?

63. Why should a utility not be allowed to discontinue service for non-payment of other bills than those for service? (i.e., coke, appliances, etc.)

NORTH DAKOTA LIGNITE DEPOSITS

The part of North Dakota lying west of the Missouri River, says a bulletin from the Department of the Interior, is richly endowed with beds of lignite, which, though of low rank and small present value compared with other coals of the country, constitute a tremendous reserve supply of fuel that sooner or later will be called upon to supply light, heat and power to the inhabitants of this and surrounding regions. Although the period of extension utilization of such fuel may not yet be at hand, geologists of the Interior Department have been examining these great fields as men and means were available for the purpose. In a report recently issued by the Geological Survey as Bulletin 775 the Marmarth lignite field, occupying the southwest corner of North Dakota, is described by Geologist C. J. Hares.

The Marmarth field is a part of the great lignite-bearing region of western North Dakota, northwestern South Dakota and eastern Montana. It includes an area of about 1,800 square miles in Slope, Bowman, Golden Valley, and Billings counties, lying principally within the valley of the Little Missouri River. The coal occurs in beds that are commonly as much as 8 to 10 feet thick, and one bed ranges from 20 to 30 feet in thickness over a large area.

As a rule the lignite is extremely tough, owing largely to its woody structure, and for that reason it is mined with considerable difficulty.

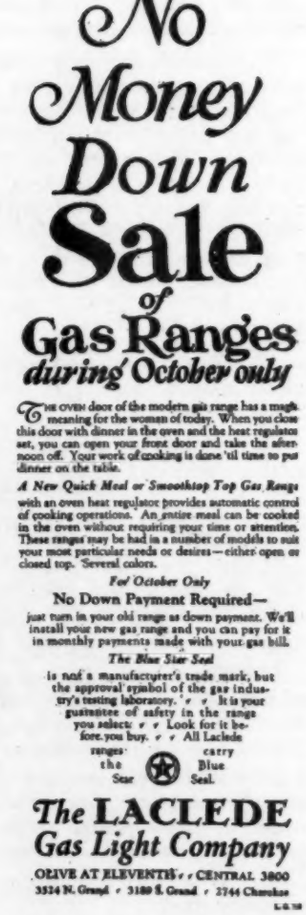
As a result of the Geological Survey's examination it was found that the field now contains a reserve of lignite estimated at more than 15,000,000,000 tons, an amount comparable with the total quantity of coal mined in the United States since coal was discovered—18,000,000,000 tons.

No definite forecast as to the future development of these abundant lignite reserves can be made at present. Undoubtedly the lignite is a great potential resource, but it may not be developed extensively until competition with the higher-rank coals of other fields is less keen or unless the advantage of superior heating and stocking qualities of other coals can be overcome by low cost mining or by special treatment of the lignite. The geographic position of the field with reference to present markets is unfavorable to early development, as there are neither large centers of population nor large industrial concerns in or near the field. If the lignite is dried and used as powdered fuel, or if it is partly carbonized and briquetted, its desirability as a fuel may be so increased as to enable it to invade markets now exclusively supplied from fields yielding coals of higher rank.

Pot o' Gold Contest

A Plan To Sell Gas Ranges

By Hylan Piper



Left to right—Manufacturer's Advertisement furnished Gas Company with boxed space for Special Offer. Advertisement featuring premiums and small down payment. Advertisement featuring "No Money Down Sale."

HERE is a range campaign designed to run for a period of four weeks, set down step by step in a manner that permits the use of the complete campaign or such parts of it as best fit in with your organization. The first step naturally is to get your forces organized. Hold a general meeting, at which the complete plan is outlined and where a full demonstration of the range or ranges to be sold is gone over by someone who knows all about them, how they are made and just what they will do for the housewife. Bring out any special features the range may have, go into the matter of sales policy, prices and terms, state what premiums, if any, are to be given and give specific information to everyone regarding commissions, bonuses and prize money.

Advertising and Publicity

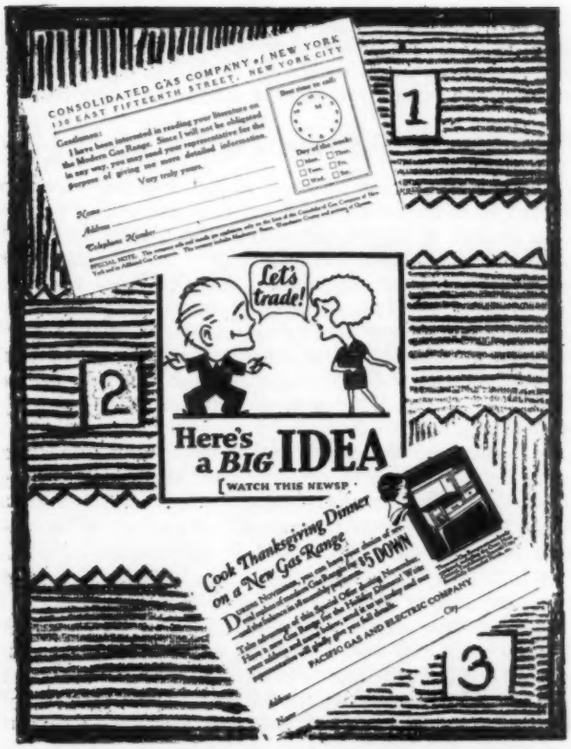
Go over all the advertising material that you expect to use during the campaign, show proofs of the newspaper advertising you expect to use, together with samples of any direct mail material.

Arrange to have every employee attend these meetings, for no matter how well laid the plans are the sale will not be a successful one if the personnel of the organization gets behind it in a half-hearted, luke-warm manner. Only confidence in the appliance and a belief that the plan offers something to every one concerned will make it a success. Frank open meeting and discussions will clear-up all questions, arouse enthusiasm and put the plan over, if the salesmanager will work out his meetings in such a manner that every person knows what is expected of him or her and is given the proper incentive for production effort.

Prospects

Leave no stone unturned to secure a live list of prospects for the field salesmen to work on;—every home with a dead service is a potential user, every range that has been in use five years is also ready to be replaced, every new home created in your city is a point of prospect for a modern range, every family that moves into a new home is a live prospect, and every person who hesitates before a range on your sales floor is interested. Concentrate on these known prospects the first week and when they have been run down lay siege upon every home on your distribution system.

Canvas singly; two-timing a housewife is not as productive as single contacts. Do not send your whole force to a neighborhood and swarm down upon it like a lot of bees. This method of "saturat-



1—Appointment Card used by New York Consolidated Gas Company. 2—Teaser Advertisement used by Mid-West Gas Company. 3—Bill Flyer used by Pacific Gas & Electric Company.

ing" a city has a bad effect. They see you coming and you will secure no response to your ring at the door. As one home manager said: "fair-warned of impending high-pressure salesmanship by all those men on our street, I just did not go to the door, so I did not know what they were selling."

All advertising should be released the day before the sale is to open, first the newspaper advertising and then the direct advertising. If teaser advertisements are to be employed they should be used about three days in advance of the opening announcement of the sale. If teasers are used too far in advance they lose their effectiveness and also absorb a goodly portion of the money that might be used to tell the advantages of the appliance you are featuring. After all that is the story you wish to get across. If you have space on your service bills, the sale should be announced there with some short snappy copy, preferably of the type that arouses interest, for example; "The Range of Ranges on sale next Monday, See our Windows, Watch newspapers for Full Details,—for you'll want one"

A number of companies are using door-bell hangers which are usually printed on "dodger" stock in colors. They are attached to door knobs the night before the sale opens. Distribution has been secured in a number of cities by employing Boy Scouts to do the work.

News Story

The local newspaper will usually co-operate with you if you will furnish them a story about your campaign that contains "news"; news that a new feature on the range saves the housewife, news that a number of new methods of cooking will be demonstrated during the sales,—news of any kind.

Do not expect to have the newspaper give you a "write-up" unless you are able to give to the editor or reporter a story that contains news that is of interest to his readers.

Demonstrations

At the opening of the sale a demonstration of the range to be featured should be conducted. This may be worked out in co-operation with some local woman's organization, a newspaper or it can be conducted strictly as a gas company demonstration. This demonstration should all be worked out well in advance and turned over to a competent demonstrator. Remember that the housewife is a busy woman, that she is interested in all that is new, including the cooking of foods and the preparation of meals, but she will not get very enthusiastic over a mediocre demonstration. Give her some new and novel dishes and she will pack the house.

Truck Banners and Home Parties

All rolling equipment used by the company should carry banners announcing the fact that the special sale is going on.

HERE'S EXTRA MONEY FOR SALESMANSHIP!
POT O' GOLD
Contest
For GASCO Gas Range Sales
Based on the attainment of our quota of The New 1929 GASCO Gas Ranges
The $ ____ will be distributed as follows;
$ ____ in 1st Pot: for ____
$ ____ " 2nd " " ____
$ " 3rd " " ____
$ " 4th " " ____
$ " 5th " " ____
$ " 6th " " ____
$ " 7th " " ____
$ " 8th " " ____
$ " 9th " " ____
$ " 10th " " ____
IS OUR QUOTA
1929 MODEL GASCO Ranges
Let's Make 100% of our Quota!
Hang Your Pots Here
1 2 3 4 5 6 7 8 9 10
WATCH YOUR POT

Contest Board

Parties may be arranged with the purchasers of the special range. Select an owner and arrange with her to invite a few friends in to luncheon, then have your economist on duty to prepare the meal and decorate the table, and show-off "the new range that made all this possible." A wide-awake economist will secure enough live prospects from such a party to make it very profitable.

Window and Store Display

Window and store displays are very important at all times and especially so when a sale of this kind is going on. See that the store is properly decorated on opening day, and that the main display is the range or ranges you expect to feature. Do not use painted paper

or cloth banners on the walls of your store. Use show cards setting forth the features of the ranges and plainly lettered price cards. Too many flashy banners detract and cheapen.

The window display should be simple and not contain an array of appliances or cards. Bear in mind that the appliance has special features and play them up. If you are giving premiums display them, but keep any and all things that do not show the woman in the home what the range will do for her, or what her money will buy, in the background—concentrate on *the* appliance and its features.

Selling Plan and Compensation

After determining the quota to be obtained set aside one dollar or more as you see fit for every range sold during the sale. This money is extra and above the regular commission and is to be used to put over the Pot o' Gold Contest. This money is to be divided among the sales people. (In some cases teams are used, in others, departments, and in still others the money is divided among the salesmen and floor sales force only. We will leave this up to you.)

Let us suppose you set a quota of 200 ranges to be sold during the four weeks drive and that you set aside $2.00 per range. This $400 would then be put into the pot and would be awarded to the various employees or sales people at the conclusion of the sale on a percentage basis, worked out on the number of ranges sold by the unit or individual.

The diagram reproduced herewith illustrates the contest board to be used in connection with this sale. It should be at least 24 inches by 36 inches and it should be displayed prominently in the salesroom or store.

Using the Board

Insert the amount of money that will be placed in the pot after the $—sign and show the number of ranges to be sold to make the quota in the box. On the hooks at the bottom of the board hang pots for all employees participating in the campaign. Letter each pot with the man's name (yellow card-board pots) and each day chalk in with colored chalk the amount of money he has in his pot. This board should be marked up daily, in connection with a short snappy review of the previous day's business and the activities planned for the day of the meeting.

In setting up the quota and prize money, the sales going below the quota set or exceeding it would only affect the money in the pot as a whole and not as a unit. In other words the amount of money to be distributed would be scaled down if the number of units sold fell short of the quota set, or would be increased if the number of units sold exceeded it.

The big idea back of every sale is to make sure that all persons in any way connected with the organization are fully informed about all the details in connection with it and are fully informed about the appliance to be featured, the terms of sale and any special offers that are to be made to the customer during the drive.

ECONOMIC CONDITIONS AND PROSPECTS FOR THE COMING YEAR

"Some of the more important economic forces which dominate the business situation as we enter the New Year are credit conditions, the degree of accumulation of merchandise stocks and of speculation in them, the size of the crops and of our current industrial output, the rate of wages and volume of employment, and the prospects of foreign trade.

"With respect to credit conditions 1928 has been an extraordinary year. The outflow of gold which began in the autumn of 1927 continued during the first half of 1928 and caused a reversal in the easy money situation that had prevailed for several years. Public attention has been fixed on the rise in the rates on stock-exchange 90-day time loans from 4½ per cent in January to 7½ per cent in the early autumn and the even greater rise in call money rates. It is well, however, to note that bank credit for commercial purposes has been in ample supply at rates ranging from less than ½ per cent higher in southern and western cities to slightly over 1 per cent in New York City while open-market rates for commercial paper have increased by only 1½ per cent during the year.

"Agriculture output during the past year was about 5 per cent larger than in 1927 and there was an even greater expansion in manufacturing production, but neither stocks of raw materials nor of manufactured goods have shown any general tendency to accumulate. There is no considerable speculation in commodities and wholesale prices average about the same as a year ago.

"Wages continue at a high level and unemployment has been reduced to a minimum. There has been a continued demand for additional workers by mercantile establishments, hotels, and the automotive industry and factories have once more been increasing the number on their payrolls. Labor conflicts in the coal and cotton textile industries were settled during the past year and relations in most sections of the labor world are now amicable.

"Activity in the automotive and construction industries has been sustained and is particularly noteworthy. Automobile production has been at a higher level in recent months than at any earlier period and contracts for future construction have been substantially greater than in the corresponding period a year ago. Production of many related products, such as iron and steel, cement, gasoline, and rubber tires has been stimulated as a result of these developments. The textile and coal industries, however, still lag behind the others.

"Foreign, as well as domestic, demand for the products of our farms and factories is steadily expanding. During the past year there has been an exceptionally large growth of our exports of finished manufactures —especially automobiles, machinery, and petroleum products.

"In general it may be stated that both industry and trade are exceptionally active as we enter the New Year."

—William F. Whiting, Secretary of Commerce.

How Los Angeles Gas and Electric Improves Its Installation Methods

As Told By Fred P. Minton, Foreman of Gas Services

BETTER installations, more permanent jobs at less cost—these are important things for the consideration of all gas companies. And it will, therefore, be interesting to learn how the Los Angeles Gas and Electric Corporation is achieving these things.

For the past several years, said Mr. Fred P. Minton, foreman of gas services of the corporation, the Gas Department of the Los Angeles Gas and Electric Corporation, has striven to improve its installation methods. The last three years have been ones of particular effort and due to the constant striving for improvement we have developed new ideas and methods which have increased our installation efficiency and produced a more permanent job. Unit costs have a decided tendency to climb due to the ever increasing amount of street pavement and other sub-surface structures as well as the added transportation mileage to reach outlying districts. From the time a customer applies for service until the installation is complete, constant vigilance is necessary to keep costs within reason and still render the best possible service.

Preliminary Inspection

Upon receipt of a service application from the customer by the Gas Distribution Department, a clerk marks on the service order the size and location of the main. The order is then turned over to the district inspector who visits the premises to see if the location provided for meters is satisfactory, determine whether or not building material is in the way of the proposed service and arrange for a satisfactory installation. The dispatcher routes the orders according to district and time for installation and when the order is received by the service man, it contains all the information necessary. This makes it possible for him to leave his station each morning with the required amount of material for the day's work.

On arrival at the job, a part of his crew, tools, welding outfit, portable vise and pipe are unloaded and the truck proceeds to another job where the same practice is followed. The service man makes a special effort to be ready to move the men as soon as each service is completed.

The installation of the service requires the digging of a trench from the main in the street to the meter location. Formerly this trench was excavated with standard size shovels, giving a ditch about fourteen inches wide. This width was considerably wider than necessary for the size of pipe used. A trench of this size means the unnecessary handling of dirt not only in the excavating, but also in backfilling. In order to eliminate this expense we have adopted the use of a special narrow spade shovel having a blade width of five inches. This keeps our ditch down to a minimum width and effects some economy by eliminating the unnecessary trenching and backfilling. In many cases where pavement is involved a boring machine is placed in the parkway and a hole bored under the paving out to the excavation over the main. The hole cut in the pavement is generally 4 ft. by 1½ ft, and is necessary to make the connection to the main.

While the boring and trenching are being done, the pipe is assembled, tested with air pressure and the joints coated with hot asphalt to resist corrosion.

Connecting Service to Main

After trenching is finished the assembled service is ready to be connected to the main. This is accomplished by welding one end of a street tee made of extra heavy pipe to the end of the service and the lower end to the main. The completed service is again given a pressure test after which a tapping machine is connected to the top of the street tee and a hole drilled into the main. After the tap is made, the machinery is removed with only a small amount of gas allowed to escape and the top of the tee is capped.

The excavation is then carefully backfilled, watered and rolled and left in a safe condition for traffic. The following day temporary repairs were made by packing oil and gravel in the excavation, which keeps the ditch in better condition. The resurfacing in most cases is done by the city's street department and there is always the possibility that the condition of the excavation will not remain in a satisfactory condition until the permanent replacement is made. The company feels that the keeping of excavations in good condition is not only a matter of safety, but a duty to the motoring public. A continuous weekly inspection of these excavations is made from the time of service installation until the pavement has been permanently replaced. This pavement inspection makes it possible for us to resurface the cuts with oil and gravel wherever the ditch has settled and not wait for an unsatisfactory condition to be brought to our attention by an outsider.

Transportation is an item of considerable importance in the Service Department as the time spent traveling between jobs is time lost which might have been spent in productive labor. This, however, is a necessary evil and the best we can do is to keep the mileage at a minimum. The majority of new services are run in the newer sections of the city and are generally the farthest from the center of our distribution system. To meet this condition, we have established at four outlying points in our system, four garages housing six service trucks. The men in charge of these trucks do not report to the main distribution office but work directly from these garages. Their materials are delivered to these points by a delivery truck once or twice a month as the occasion demands. This method enables us to save at least one hour per day for each

truck as well as to minimize the danger of traffic accidents which is present when our trucks drive in congested areas.

Transportation Reduced

All men with the exception of the truck driver and the service man report directly to the job and no transportation is involved in getting them to or from work. This also reduces transportation as well as serving to keep the men productive a longer period of time.

The inspectors in looking up the work to be done, make every effort to have all services on a particular street or vicinity, installed at the same time. This makes considerable less mileage per order than if the separate trips were made to install each service.

Supervision of these crews is a little more difficult than ordinary mechanical work done in a shop. Two reasons for this are that the crews are frequently moving and also the finished product is covered up so that inspection of workmanship is not possible after the completion of the job. To meet these conditions, we have the Service Dispatcher make a route sheet each morning showing the addresses to be worked during the day and the order in which the stops are to be made. Each crew is then visited at least once every day and usually twice a day. These visits are made by the Foreman of Services and the two Assistant Foremen. At the time of these visits, close inspection is made of the class of workmanship, condition of street excavation and appearance of the truck and equipment.

Every service man turns in a daily report slip showing the amount of pipe installed per man. The Foreman and Assistant Foreman keep each service man posted as to the showing made by other crews and in this way a spirit of competition is injected into the work. The service man's daily report is not used for the official record of pipe installed, this record being tabulated monthly by a clerk from the complete service orders and time sheets. These daily visits by the Foreman also serve to stimulate each man's interest in his task and many helpful suggestions have been received from the men, due to this interest in their work.

We feel that the functioning of the Service Department is one of considerable importance. While the pipe sizes installed are relatively small, the footage is enormous. During the year 1927 the total length of service pipe installed by this company was 902,940 feet, or 171 miles of pipe.

DELIVERIES OF GAS OIL AND FUEL INCREASE DURING 1927

Deliveries of gas oil and fuel oil, during 1927, including exports and shipments to non-contiguous territories, reached a total of 381,151,000 barrels, as compared with 372,381,000 barrels in 1926, according to E. B. Swanson, economic analyst, United States Bureau of Mines, Department of Commerce, which has just completed a national survey of fuel oil distribution, in cooperation with the American Petroleum Institute. This increase of 8,770,000 barrels in total deliveries resulted from increased shipments to foreign countries, as the quantities delivered within the United States showed a slight decrease from 334,030,000 barrels in 1926 to 333,760,000 barrels in 1927.

The domestic demand for gas oil and fuel oil was stimulated by the increased requirements for bunker fuel by oil-burning steamers and the increasing installations of domestic and commercial oil-burning heating plants.

Railroad purchases of fuel oil were less in 1927 than in the preceding year, as fuel-oil stocks which had been increased during 1926 were drawn upon in 1927.

Deliveries of gas oil and fuel oil to gas and electric power plants decreased from 33,652,000 barrels in 1926 to 29,775,000 barrels in 1927. Of this decrease of 3,877,000 barrels, 2,617,000 barrels is accounted for by the decreased demand for oil as a fuel in the generation of electric power, and 1,260,000 barrels by the decrease in consumption of oil in the manufacture of artificial gas.

The consumption of oil as a fuel by petroleum refineries and producers dropped from 48,701,000 barrels in 1926 to 43,453,000 barrels in 1927. Other major decreases include the lessened requirements for general manufacturing and various smelters and steel mills. If the decrease of approximately 5,250,000 barrels in the fuel-oil requirements of the petroleum industry itself should be eliminated from this general comparison, deliveries to other industries which form the domestic fuel-oil market would show an increase in 1927 over 1926 of approximately the same amount as the decrease in fuel-oil requirements of the petroleum industry. This

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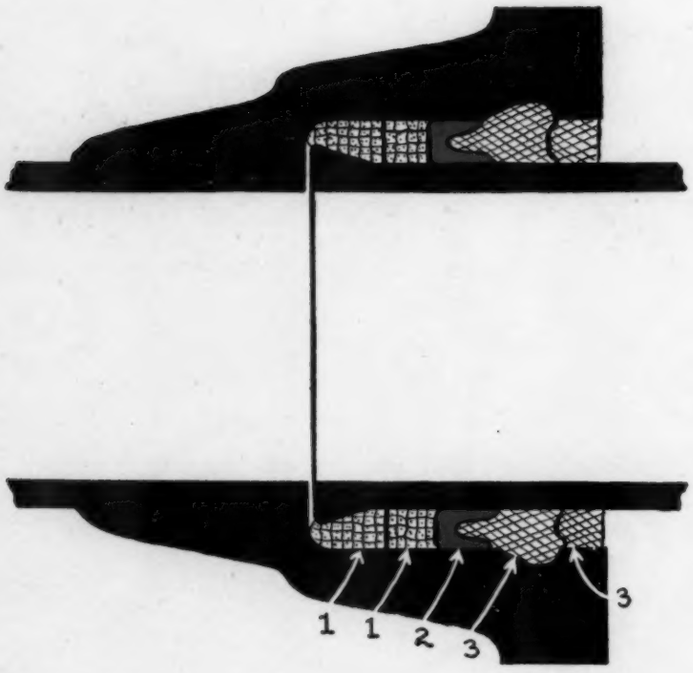

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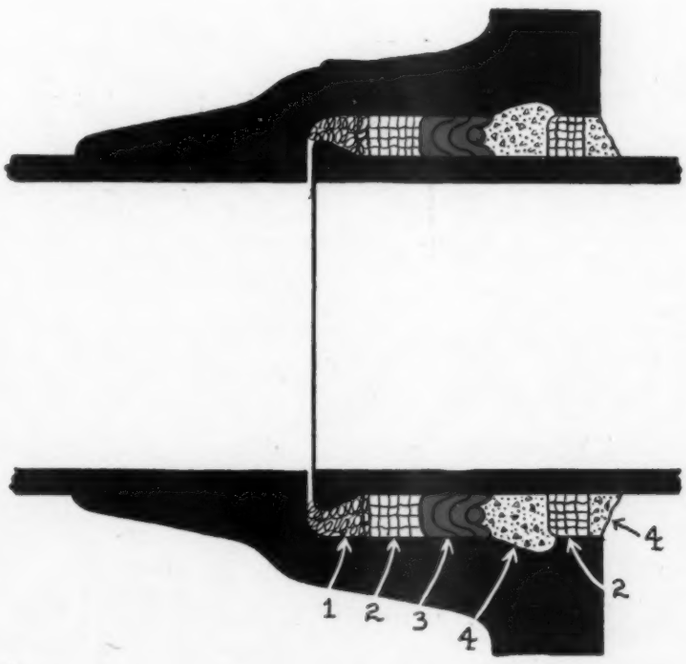

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TECHNICAL AND GENERAL MISCELLANY

TEMPERATURES OF WELDING FLAMES

The factors controlling the theoretical flame temperatures of oxyacetylene and oxy-illuminating gas flames are discussed. The temperature distributon in such flames has been determined by introducing gradually long the axis of the flames cones of refractory material of known melting point, and observing the point at which they melt. Although an oxy-illuminating gas flame develops a slightly lower maximum temperature than an oxy-acetylene flame of the same listed power, the greater efficiency of the latter is not due to this difference, but is due to the greater total quantity of heat produced per unit time.—*Wehrmann, Gas Und Wasserfach, 1928, volume 71, pages 950-52.*

SOIL CORROSION STUDIES

The Bureau of Standards has inaugurated a study of soil corrosion, which though commenced in 1922 is still in the initial stage and will not be finished for several years. A preliminary report on the work has been published in Technologic Paper No. 368. The scope of the investigation is outlined, soils are described and classified and tests are made on uncoated steel and iron pipes, on metallic protective coatings, bituminous coating materials and also miscellaneous materials such as lead sheath materials, parkway cable, brass fittings, ferrous and non-ferrous plates and sheets and wood fiber pipe.

A number of important conclusions have been drawn from the observations made at this investigation. It has been indicated that in the majority of soils the rate of corrosion is slow and in some it is practically negligible. There is a tendency for the rate of corrosion to decrease with time in many soils, and the rate of penetration of the pipe wall apparently decreases still more rapidly. While no one material that is suitable for general use for pipe lines now appears superior to all other in all soils, there is an indication that a saving can be effected by the proper selection of a pipe material with respect to the soil condition that it will encounter.

Thin dip coatings of bituminous materials furnish insufficient protection against severely corrosive soil conditions. It is also indicated that a coating satisfactory for one soil may not be satisfactory for another, and that in order to use data on protective coatings tested in one locality for predicting results to be obtained in another locality soil conditions must be studied.

Tests on the nonferrous metals have not continued long enough to yield many data. It is however indicated that the rate of corrosion of copper and its alloys is generally low and nearly uniform. Pitting occurs on lead and zinc in some soils, and the corrosion of some alloys of aluminum is rapid under some soil conditions.

LEAKAGE FROM HIGH PRESSURE NATURAL GAS TRANSMISSION LINES

Systematic tests and the location and repair of leaks can go far toward eliminating losses of natural gas in high pressure transmission lines. Three common types of joints have been used on these lines, namely screwed, rubber coupled and welded. The difficulty of obtaining tight connections in the screwed joints on large pipe has limited screwed connections to small field and gathering lines (diameter of two to four inches).

Main transmission lines, six to twenty inches in diameter, are generally permanent installations and therefore are laid in ditches and covered. Rubber-coupled or welded joints are used in the construction. If special precautions are used in constructing rubber-coupled joints to have a perfectly smooth connection between the rubber and the pipe and to tighten the bolts properly through the sleeves that hold the rubber in place, the leakage from the line can be minimized. Rubber-coupled joints must, however, be inspected regularly.

Welded joints are preferred in many cases. The effectiveness depends upon the individual welder. The effects of expansion and contraction of the metal in the pipe from temperature changes must be considered. Two methods may be used to counteract this effect; expansion joints may be located at suitable places in the line to allow any movement of the pipe that is necessary, or enough "slack" may be left to allow expansion of the metal without producing any strains in it. In practice a combination of slack and expansion joints is used. As each expansion joint is a potential source of leakage, it is preferable to limit the number of expansion joints by providing more slack.

Tests made by the Bureau of Mines show that after the main joints of a transmission system are installed properly the largest part of the leakage is from connections and fittings on the lines. The Bureau has devised a satisfactory method for testing pipe lines for leakage, the laws governing gas leakage have been established, typical transmission lines have been surveyed and possible improvements in the construction and operation of transmission lines have been outlined. The reader is referred to Bulletin No. 265 of the Bureau of Mines, price 25 cents, Government Printing Office, Washington, D. C.

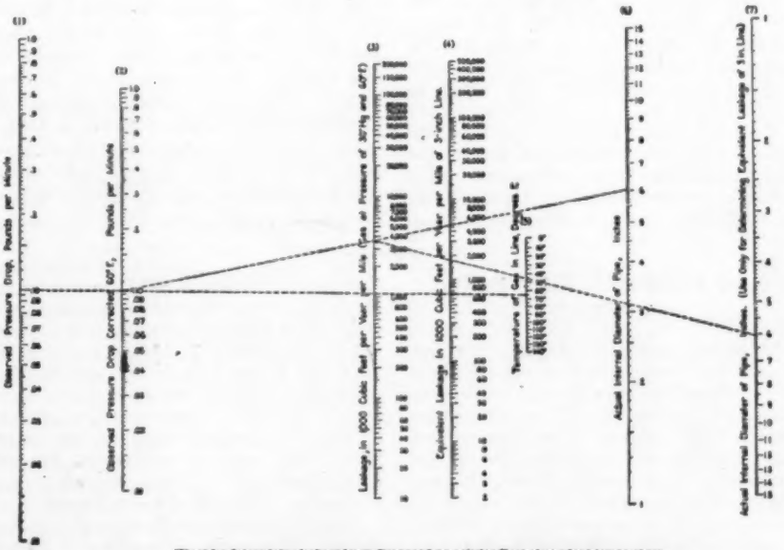

(1)
Observed Pressure Drop, Pounds per Minute
(2)
Observed Pressure Drop Corrected 60° F., Pounds per Minute
(3)
Leakage, in 000 Cubic Feet per Year per Mile Gas at Pressure of 30"Hg and 60°F.
(4)
Equivalent Leakage in 1000 Cubic Feet per Year per Mile of 2-inch Line
Temperature of Gas in Line, Degrees F.
(5)
Actual Internal Diameter of Pipe, Inches
(6)
Actual Internal Diameter of Pipe, Inches (Use Only for Determining Equivalent Leakage of 2 in. Line)

Chart for determining leakage losses from gas transmission lines at constant temperature

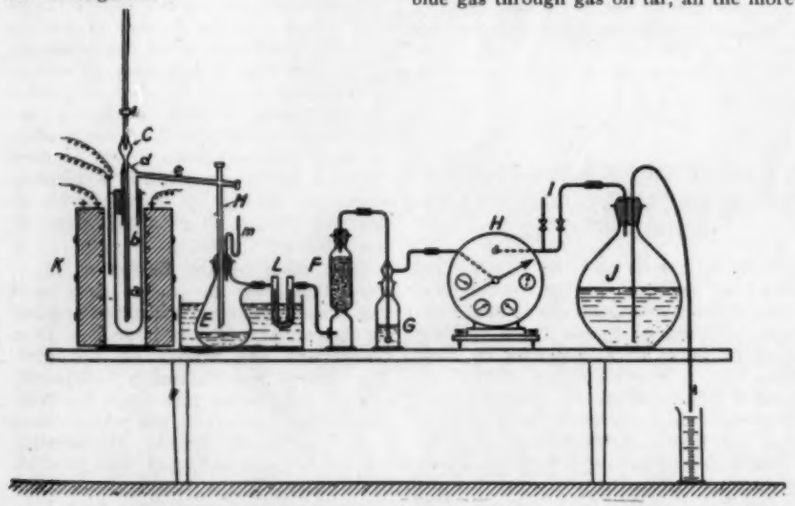
NOTE.—This chart may be used where test for leakage is made by the shut-in pressure-drop method and where temperature in line does not change while test is being conducted.

PROCEDURE FOR USING CHART

First find the rate of pressure drop by taking pressure readings over a period of time and dividing the difference in pressure readings by the elapsed time in minutes. Locating the value thus determined on scale *1* connect it by a straight line with the observed temperature on scale *5*. The observed pressure drop corrected to 60° F. is then read at the intersection of this line with scale *2*. Connect this point with size of pipe on scale *6* and read leakage loss per year per mile of line at intersection on scale *3*. To obtain the equivalent leakage for a 2-inch line connect the point found on scale *3* with size of pipe on scale *7*. The intersection of this line with scale *4* will give the value of the equivalent leakage for a 2-inch line. (Prepared by E. D. Bennett, natural-gas engineer, Bureau of Mines, April, 1928.)

MANUFACTURE OF CARBURETTED WATER GAS

A study was made of the mechanism of the process of cracking oil to manufacture carburetted water gas. The following factors were established as being of the greatest importance in governing the results of carburetion, namely, the temperature of the cracking or carburetting chamber, the pressure, the presence of foreign substances which are able to act as catalysts, the feed of gas oil and the cubical contents of the carburetter. An experimental apparatus was used in the investigation.



In this apparatus the cracking chamber is represented by the tube (b), which is arranged within an electric furnace (K) in a vertical position. The central tube (a) serves for the introduction of the gas oil. The control of the flow is effected by means of a stopcock. The gases are led away by means of the tube (e) to a condenser flask (E) which is placed in a bath of circulating water. Additional parts of the apparatus are (L) a tube filled with cotton for retaining traces of tar in the gas, a tower (F) filled with iron oxide for removing sulphuretted hydrogen, washing flasks (G) containing picric acid for removing naphthalene, a meter (H) and a reservoir (J) for storing the gas.

An experimental apparatus was also provided for the study of the cracking of gas oil in the presence of water gas for the manufacture of carburetted water gas. The original article contains numerous tables and curves which give the various results obtained in the experiments.

Crackling gas oil in the presence of water gas, containing water, reveals the fact that the thermal yield of the carburation is slightly enhanced by bubbling blue gas through gas oil tar, all the more so for the reason that the thermal power of the carburetted gas is low. Tests carried out in the plant itself indicated that the laboratory experiments gave results which were from three to four per cent too low. Water vapor in the blue gas is converted into carbon monoxide and hydrogen in the presence of carbon in the carburetter. Nascent hydrogen is produced in this manner, and this, being much more active than ordinary hydrogen, allows the formation of uncondensable hydrocarbons.—*M. A. Baril, Chaleur et Industrie, 1928, pages 257-271.*

GAS AS FUEL FOR CORE OVENS

A survey on the use of gas as fuel for firing core ovens in the plant of the Pyott Foundry Co., Chicago, Ill., is published in Graphite, Sept.-Oct., 1928, pages 101-f. The company manufactures grey iron castings used in pulleys, gears, and transmission equipment. Cores of many forms, weighing from a few ounces to more than 25 pounds, are baked in three ovens which were originally built for coke firing. The ovens were rebuilt for gas firing and handle about ten tons of core daily, using approximately 269,000 cubic feet of gas per month. Results obtained with gas have been satisfactory from the operating standpoint and the change has also been advantageous in that saving totally $1,088.15 a year are being effected in core making costs.

The core baking is carried out in one drawer-type oven 8 feet deep, 4 feet wide and 6 feet high inside, and in two truck-type ovens 16 feet deep, 8 feet wide and 7 feet high inside. A single row of burners is installed close to the floor along both sides of each oven. An all motor-driven centrifugal blower furnishes the air required for combustion.

The advantages which were gained by the use of gas are summarized to be as follows:—greater uniformity of heating, reduction in labor, saving in space and general improvement of working condition reduced maintenance, less core spoilage and reduction in the amount of core oil used.

The ovens are fired at a daily cost of $9.70 or at a unit cost of $0.97 per ton of cores, while when coke was used the cost was $11.00 a day or $1.10 per ton of cores. Saving in firing cost is $390.00 a year and saving in core oil is $689.00 a year and in fire-box maintenance $9.15 a year.

TESTS ON COALS FOR HOUSE HEATING BOILERS

Five hundred coals were tested under the auspicies of the Bureau of Mines. The average operating efficiencies of various types of boilers when used with a wide variety of kinds and grades of coal were compared. The tests were carried out on four boilers, and the coal, water, and other quantities involved in the experiments were accurately measured. All the various grades of coal in the common classification were used and first analyzed and their theoretical thermal value determined. The report contains numerous curves and tabulations containing the results of the investigation.

The general conclusions reached were as follows:—

1. The average over-all efficiency from all the tests was 58 per cent for an average rate of output of 65,700 B.T.U. per hour, which is equivalent to 262 square feet of steam radiation. The average coal burned per hour was 2.8 pounds per square foot of grate surface.

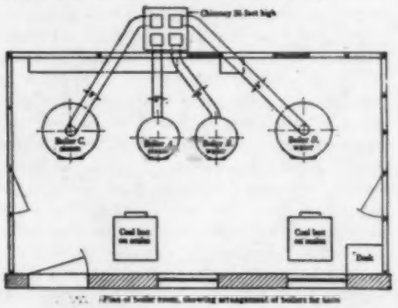
2. The hot water boilers gave three per cent higher efficiency than the steam boilers.

3. The boiler having the larger grate, combustion space, and heating surface gave four per cent higher efficiency.

4. The highest efficiencies were obtained with anthracite but were lower than they should be, due to high ash-pit loss.

5. The semi-bituminous coals gave a lower efficiency than the bituminous coals because of the high ash-pit loss.

6. If the ash-pit loss is neglected, the efficiency of boiler and furnace shows a slow but constant increase from the subbituminous coal to the semi-anthracite, and the increase then becomes rapid.



7. The ash-pit loss increased with the percentage of ash in the coal from about three per cent with no ash to about seven per cent with the highest ash for the bituminous coals. The loss was higher with the anthracite than with the bituminous coals.

8. The average all-around efficiency was independent of the moisture content.

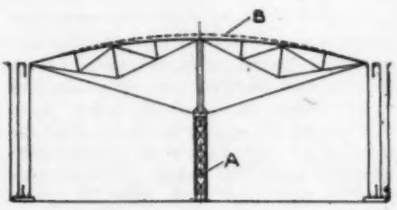
This is equivalent to saying that the coals high in moisture had other characteristics that offset the loss due to the moisture.

9. The average over-all efficiency was independent of the calorific value of the coals. One can interpret this as meaning only that the combustible part burned as efficiently when associated with high as with low ash content. The dollar value of the coals depends upon the calorific value and is proportional to the calorific value multiplied by the over-all efficiency. —*P. Nicholls, S. B. Flagg and C. E. Augustine. Bureau of Mines Bulletin No. 276.*

CROWN FRAMING OF GAS HOLDERS

The primary object of crown framing is to provide adequate support to the domed roof of the holder when it is at rest in the tank or out of commission. This means of support is necessary due to the fact that the thickness of the crown sheeting is very small in comparison with the diametrical area it covers and in consequence does not possess sufficient stiffness to retain its original shape without assistance when the inner lift of the holder is landed on the rest bricks.

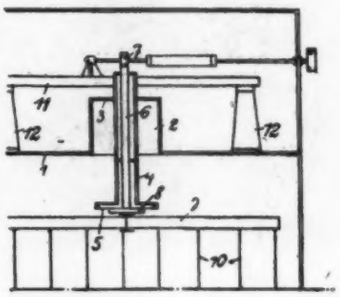
The old system of supporting the crown sheeting is described, and it is pointed out that as gas holders became larger, it was found necessary to support the crown by means of a permanent system of timber or steel framing attached to uprights fixed to the tank bottom. Within recent years, owing to the necessity of providing increased gas holder pressure, it has become desirable to revert to the trussed crown framing attached to the top curb of the holder, while the center of the framing is supported by a brick or steel pier "A" as shown in the accompanying illustration.



The chief advantages of this type of framing are that the gas pressure thrown by the inflated holder is increased in proportion to the weight of the crown framing, and that the compressive load acting on the top curb of the inflated holder may be considerably reduced, providing the framing is carefully designed. The author works out various formulae which determine the pressure in the gas from the weight of the holder and the diameter, as well as the different load conditions on the crown, etc.—*S. M. Milbourne, Gas Journal, 1928, pages 329-330.*

ELECTRICAL GAS PURIFIER WITH SHAKING ELECTRODES

An insulator (2), seen in the accompanying illustration, is built into the walls of the precipitating chamber of an electrical gas purifier. This insulator is made of quartz and is cylindrical in shape.



A hollow part (4) is inserted through the insulator (2) or its cover (3), and this part is provided at its lower end with a membrane (5). A rod (6) is passed through the hollow member and at its upper end this rod is so connected with a driving shaft that its lower end is lifted and lowered in contact with the membrane (5). A plate (8) rests on the membrane (5) and this plate acts against the supporting device (9) used to hold the shaking electrodes (10). The hollow piece (6) is connected with the high tension bus bar (11), which is supported by the insulators (12). This and the rods or bars (11) are separated from the gas space by the insulator (2).—*Metallbank und Metallurgische Gesellschaft A. G., Frankfurt am Main, Germany. German Patent No. 463,642.*

SIMPLIFICATION OF CALCULATION IN GAS ANALYSIS

If a gas is collected over water, then before the quantity of gas can be determined it is necessary to deduct the vapor tension of water at the existing temperature of the experiment. Logarithmic calculation is generally necessary. However, the following empirical rule may be followed which allows rapid calculation of the correction without the necessity of going through an involved series of mathematical processes. If the temperature at which the experiment is carried out lies between 11 and 21 degrees C, then there are deducted from the barometric reading in millimeters as many millimeters as are equivalent to the temperature in degrees C. The resulting pressure is the partial pressure of the dry gas.

For example, if the barometer reads 750 millimeters and the temperature of the gas is 20 degrees C, then the corrected pressure is 750—20 or 730 millimeters. Calculation will show that such a procedure is approximately correct, the calculated correction varying from the approximate one by plus or minus 0.4 millimeter. This error is no greater at best than what is incurred in the gas analysis itself.—*L. Zechmeister, Chemiker Zeitung, 1928, 887.*

AUTOMATIC GAS CONTROL

A device for automatically closing a gas cock (2) (see accompanying illustration) on accidental extinction of the flame comprises a clockwork train (A) the fan brake (25) of which is held by a detent rod (14) connected to a piston (12) forced outwards against spring action (17) by air pressure in an air tight thermal vessel exposed to the heat of the flame. A conical sealing surface (16) on the piston forms a seal on the partition (15) to prevent escape of air past the piston. To guard against overpressure a spring-pressed relief valve (21) is provided. When the detent (14) is withdrawn by the cooling of the air column consequent on the extinction of the flame, the clockwork closes the gas valve, which is connected to the center spindle (7); also the arm (27) operating on the lever (24) opens the valve (21) and restores the air column and vessel to atmospheric pressure.

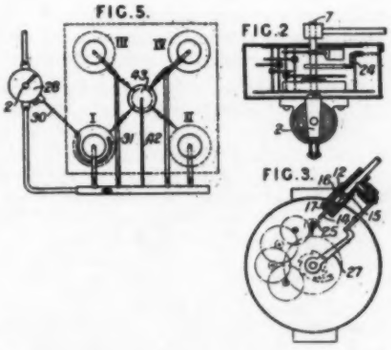


Figure 5 shows the application of the automatic thermal and clockwork device (28), (30), (31) for automatically closing the gas valve (2) on accidental extinction of the flame, to the first burner (I) of a set of four burners (I), (II), (III) and (IV). A constantly burning pilot flame is projected from a central burner (43) into the vicinity of each burner to relight the same after temporary extinction. These pilot flames are, however, all under the control of the master thermal valve (2). The pilot burner is separately fed by a pipe (42) and is protected by a domed cover.—*R. Langer, Gleiwitz, Germany. British Patent No. 295,181.*

RED LEAD BITUMINOUS COATING FOR UNDERGROUND PIPES

Coatings on underground piping must not only protect the pipe against corrosion, but they must also be as permanent

as possible. Bituminous coatings do not solve completely the problem of long time protection of pipe lines. They are susceptible to temperature changes and the short range between the brittle and softening temperatures partly accounts for the corrosion which occurs. The bond between the metal and the coating is not so strong that in certain types of soils the coating cannot be pulled away from the metal by the soil. The asphalt type of coating is not so durable as the coal tar type and may be disintegrated in a short time by the acidic or alkaline soils. It is important to have a thin protective coating next to the metal which is tenacious, impervious and durable and which is not so susceptible to temperature changes. Over such a coating the usual bituminous coating could then be applied and better protection would be obtained.

Thus the red lead bituminous coating has been successfully used for this purpose. This protective coat has a hard impervious film of red lead paint introduced between the metal and the bituminous coating. The red lead paint adheres more closely to the metal than does a bituminuos coat and protects the metal in case of a permanent or temporary break in the bituminous coating. The red lead coating is not soluble in the bituminous coating which protects the former from the softening action of the moisture and corrosive salts of the earth.

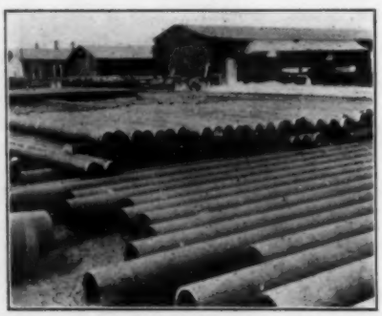
The red lead paint is applied by means of a long handled brush on a freshly sand-blasted pipe. The pipe is first given a heat treatment by heating it in a furnace to 1200 to 1300 degrees F. The pipe is then sand-blasted, at which time the temperature is about 1000 degrees F. The red lead paint is brushed on when the pipe cools to about 300 degrees F. A mix of 2.5 gallons of linseed oil with suitable drier to 100 pounds of paste red lead proves satisfactory. When the red lead paint is dry, the bituminous coat is applied.—*C. H. Rose, The Dutch Boy Quarterly, vol. 6, number 3, 1928, page 23.*

AN EMERGENCY CUTTING AND WELDING JOB

A very interesting emergency use of welding was recently illustrated in a building job. While this was a construction problem, nevertheless, a similar one could always arise in an industrial plant. Anchor bolts were sunk into piers to which bridge posts were ready to be attached and at the last moment it was found that the bolts were short by several inches. The welder was called in to weld on new lengths which would give the desired extension, and thus avoid the task of tearing out the concrete piers or coring around the bolts to sink new ones. The oxyacetylene blowpipe was used in this operation with good results. The illustration shows a welder at work on the job.

DOUBLE LENGTHENING STANDARD PIPE

Welding together two standard lengths of cast iron pipe with bronze welding rod at the pipe foundry is now standard practice in some foundries to reduce the cost of laying the pipe in the field. The photograph shows double length pipe ready for shipment.



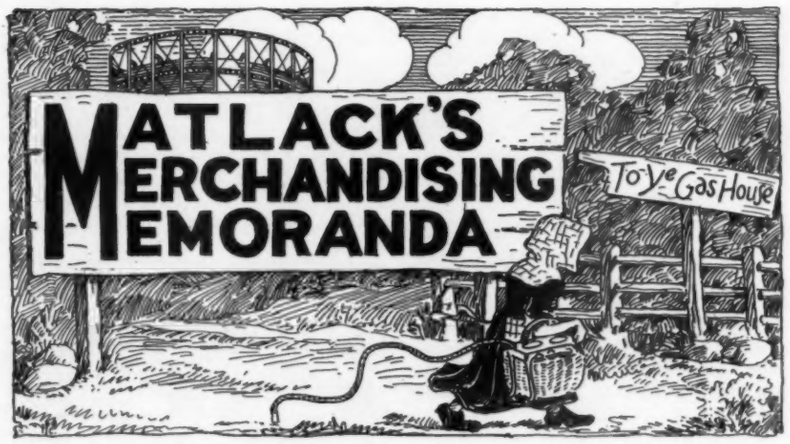
ANALYSIS OF GAS AND GAS PRODUCTS

A long continuous article was published during 1928 in Monats Bulletin on the analysis of gas and gas products. Many different methods for determining naphthalene are described in this article and the gas chemist will find there complete details of the various methods for determining naphthalene. The article is also well illustrated and contains many references to the literature.

All the methods proposed are examined critically and the important picric acid methods are tested by experiment with the idea of developing a generally useful and quick method for the quantitative determination of the naphthalene content of gases, solvents, tar oils and tars. It was also shown that the following points must be borne in mind in obtaining a correct figure for the naphthalene content.

First, a simple apparatus must be used and no rubber connections must be used. Such an apparatus was designed. Second, the naphthalene picrate must be accurately determined. It was shown that the picrate can be quantitatively separated from excess picric acid by filtering through a Jena glass suction filter, and then it can be determined after decomposition by water by means of n/50 or n/100 sodium thiosulphate solution. Third, it is necessary to oxidize the unsaturated and other easily oxidizable compounds, volatilized with the naphthalene, by means of potassium permanganate solution in the cold. In the fourth place, the duration of the distillation must be limited to about thirty minutes when the following weights of samples of various substances are employed: light oils and benzol wash oils 0.1 to 0.2 gram; saturated benzol wash oils 0.05 to 0.1 gram; fresh naphthalene wash oils 0.15 to 0.25 gram; saturated naphthalene wash oils 0.05 to 0.15 gram; heavy oils and anthracene oils 0.2 to 0.5 gram; crude naphthalene 0.02 to 0.05 gram. The temperature of the water bath must be maintained at about 70 degrees C and the speed of the flow of gas should be 25 liters per hour.

It was found that there is a very close connection between the various physical constants of the tars, tar oils and solvents (such as the content of oils, of free carbon, the ease of flow of the product and the resistance to cold) and the naphthalene content. It was confirmed that the cooling methods are not suitable for determining the approximate amount ot napthalene in tars and tar oils. The solubility of napthalene at various temperatures in benzol, toluol and xylol as well as various tar oils was determined.



HOW TO INCREASE THE LOAD

Here's an idea that beats giving a $10.00 allowance for an old range—"give a ten mantle Radiant Heater," says Charlie Harbison. With the new colored radiant heaters displayed with the range being featured, this should prove a "puller".

Combination sales are often productive and we know of one commercial manager who stages two combination sales each year;—one, a combination of a circulating water heater and a range in the spring and the other, a laundry stove and a range in the summer. Both have proven worth while and are now an annual on his sales calendar.

"PRINTED SALESMANSHIP"

"Advertising," someone has said, "is printed salesmanship" and "the prime requisites of salesmanship" said someone else, "are first, a complete knowledge of the merchandise and its value to the ultimate user and second, the knowledge of how to acquaint the ultimate user with the fact that it will be of benefit to him, and cause him to exchange for it some of his hard earned cash."

There are many factors going to make up good personal salesmanship and likewise, there are equally as many factors going to make up "printed salesmanship." Typography, layout or design, art work and copy are all essential to good advertising. During the past few years, you will recall that gas range advertisements have had less of the cast iron, nickel, steel and enamel twang to them. On the other hand they have contained more of the "what-it-will-do-for-you" copy. That is, more and more gas men have dwelt on the theme of "happiness in home work," when writing range copy and less on the mechanics. This seems fitting, for aside from the fact that Mrs. Brown's range is more expensive than Mrs. Jones', what the woman in the home wants to know about a gas range or any other appliance is; "what will it do for me "

It seems that if copy men could be made to see the value of that "what it will do for me" theme and write more of his copy along this angle it would be helpful. Notwithstanding the very great improvement in gas appliance advertising during the past few years it appears that maybe we are not giving enough time and thought to our copy in many instances. The natural gas companies have gotten the knack, judging from the number of them that captured prizes in the P. U. A. A. better copy contest.

LAYING THE FOUNDATION

The New Year looks very promising and it will be, for those who plan their work and work their plan; who lay out their sales programs carefully, noting each and every detail and then follow them up. Advertising, store and window display, prices and terms and employee education and co-operation will all have to have due attention follow-up.

As we review it there has been no shortage of plans to merchandise the several load building appliances but there has been a lack of foundation laying. In a number of instances we have seen excellent plans, dealer helps advertising and what not, employed with a resultant mediocre return. Somewhere down the line someone connected with the plan building neglected to see that the men who were to go out and get the customer's signature on the order had a thorough knowledge of the appliance and what it would do for the customer.

The foundation of increased selling and increased sales lies in salesmen's education. The man who goes out to get the down payment should know the appliance being featured from "soup to nuts."

JIM JAM

Jim Trainer is doing his share to the gas man to build up gas sales per meter. Listen to what he has to say now:

"Price is the fee paid for ownership.

"Value is the measure of service rendered.

"The real profit to the gas company from the sale of any domestic application is not measured by the fee paid for ownership, but by the revenue from the use of the appliance, governed by the extent to which the owner of the appliance takes advantage of the services which the application will render.

"Many gas company merchandisers consider a job well done when an appliance is sold. According to my notion the job is only started.

"Any gas appliance sale is of little value to the gas company if that appliance is not used and revenue is being lost to the gas company so long as that appliance is not used to its maximum, in the home in which it is installed.

"The real job, therefore, is to sell the maximum use of any and every domestic application for gas. Uses by the customer of domestic appliances for gas, are so interlocked that the maximum revenue from one depends upon the others, and it practically becomes imperative to secure the maximum service from one appliance that the customer be sold every other application.

"Otherwise so far as the domestic use for gas is concerned we might as well go into the grocery business."

"Jim Trainer."

That's good work James; keep it up.

That youngster looks like he is starting out RIGHT!
JANUARY
INVENTORY SALE
1929
S M T W T F S
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
1929 SALES CALENDER 1929
Book of Sales Plans
1929

PROPER STRAPHANGER BAIT

When you use street car cards be very certain that you reduce your copy to a minimum. Make your cards miniature bulletin boards, for you have to get your message over very quickly as a rule. Also watch your colors, shades and shadows; the lighting of street cars makes certain color combinations very hard to read.

ENLIST THE WOMEN EMPLOYEES

Interesting women employees in good-housekeeping by offering them opportunities to build display windows and decorate stores, is a work that is very much worth while and one which if properly directed will produce excellent results. To get folks to do things is to interest them and to interest them is to get them to do things. You'd be surprised how very helpful it is to merchandising as well as to customer relations when the young ladies of an organization feel that they are "let in on everything."

You tell the public about your merchanddise; why not tell your employees? Every man and woman who is employed by a public utility company should know at all times what the company has to offer the public. That they do know cannot be taken for granted. Copies of newspaper adertisement, copies of sales plans, announcements of new appliances, special terms and prices in fact, every activity, should be brought to the attention of each and every department through announcements on department bulletin boards.

VIA THE WAFFLE ROUTE

Why not advertise the advantage of cooking waffles over the hot flame of the gas range on a gas waffle iron, furnishing a tested recipe in the advertisement? Why not work out a weekly store demonstration and display, a window display, and an employees sale of waffle irons?

One company that we know of is planning to make a special of waffle irons during February and as an incentive to employees to sell waffle irons they will pay a commission of 25 cents for each iron sold. This sort of effort not only helps keep up the per meter sendout but helps in a big way to get the rank and file of employees interested in the sale of merchandise.

A WORD ON WINDOW TRIM

At the beginning of the New Year the gas men should give some thought to a program of window display advertising. This program should take into consideration what plans have been built up for special sales in order that displays may be worked out to tie-in with these sales and other plans should be made to build windows that tie into National and local holidays. Many of these displays may be built along the lines of those illustrated in the A. G. A. service or ideas may be secured by going through the files of The American Gas Journal.

Window Display Advertising ranks second with a great many merchandisers these days in power of persuasion. Women, so it is said, pay as much attention to window display advertising as they do to other forms of advertising and with this thought in mind we know of a group of companies in the Middle West who are now working out a Girls Window Display Committee and are offering prizes to groups of girls for devising and building the best display windows. It's a capital idea and keeps up interest in that phase of merchandising that is so essential good-housekeeping.

SOUND ADVICE

"Follow-up your house heating customers," said a successful house heating salesman the other day. "Along about the time the weather breaks into a cold snap, I call on just as many of my old customers as I can. I visit them personally and when I can't reach them at their places of business I 'phone them and ask: 'How's the old gas furnace going?'" And then after

a little chat I ask them if they have been asked by any of their friends how they liked gas, the carefree fuel. I do this to secure prospects and you would be surprised how many I unearth in just this way. Why about half the time, after I've asked the customer about his furnace, he will say: 'By the way so-and-so is very much interested in heating his home with gas, get hold of him, tell him I sent you'."

It's the old, old story of selling your customer so well and so completely that he immediately becomes a member of your sales force. Folks who appreciate the advantages and comforts of gas heated houses also have friends that will, if approached. Also, there's the ever present crowd who want to keep up with the Jones.

NON-CONSUMING APPLIANCES

We understand that there is a move on foot this year to boost the sales of gas per meter in a manner never before attempted and to entirely discontinue the selling of appliances that produce no direct revenue in that direction. "It seems

to me," said one traveler, "that the powers that be have had some of the boys on the carpet regarding the selling of non-consuming appliances and I know of one big holding company that will discontinue the sale of all such appliances this year.

"It makes me feel mighty good for now I am of the opinion that I can go to my salesmanager and show him that it will be profitable for us to give this company some real helps, helps that we could not afford to give when the company devoted so much time to selling non-consuming appliances."

MAKE YOUR COPY SAY SOMETHING

Copy is the thing in advertising and it seems that the men who are writing the gas appliance advertisements today are using more of it and of a better quality than ever before. Glancing over the campaigns that have been produced to help the gas man sell more appliances this winter and during the coming months we find

some very interesting copy; for instance, here is a range advertisement that is apropos.

The illustration and the head-line are such that they will attract attention and cause the homemanager to read, and by reading she cannot help getting the idea that unless her range is equipped with oven control she is cooking blindfolded.

Another interesting campaign is the "Stop Thief Campaign" gotten out by one of the water heater manufacturers. It puts over the idea that the furnace coil and all other such contrivances are petty grafters of heat units and that the only satisfactory and efficient way to have hot water service in the home is to install a storage or continuous flow gas water heater.

HOME ECONOMICS PAGES

Home Economics Pages are becoming very popular with home managers and a number of newspapers, food products manufacturers and dealers are taking full advantage of the fact and are using these pages and sections to advertise their products. It seems that these sections should also prove popular places for gas company and appliance dealers and manufacturers advertisements.

With Good Things Cooked
She awaits the family's homecoming with a smile
She had seen the articles on appetizing dishes in the Post-Dispatch Home Economic pages and her enthusiasm grew in their preparation.
More food buying, preparing and serving suggestions appear in the Post-Dispatch today.
The Post-Dispatch prints more Food advertising than the three other St. Louis newspapers combined!

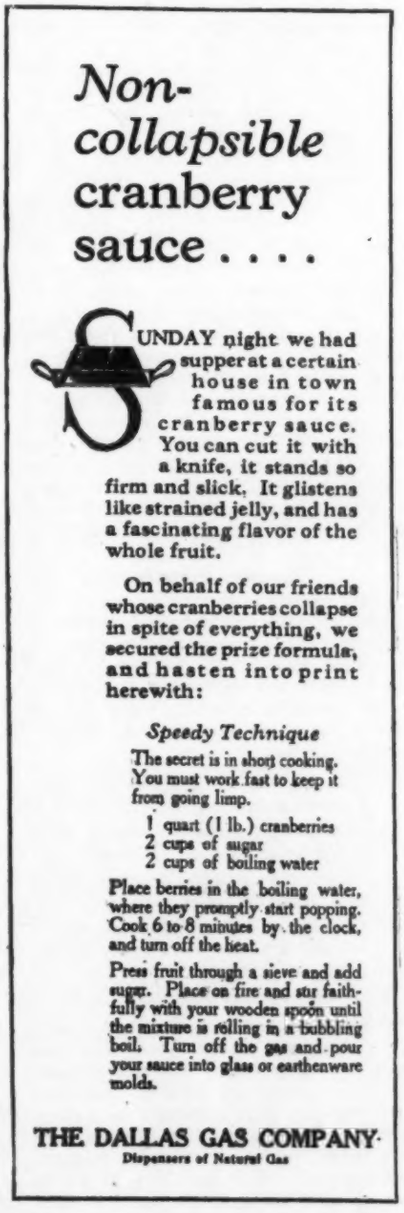
The St. Louis Post-Dispatch thinks so much of its Home Economics Page that it advertises it with the only advertisement on the front page of that big newspaper. It is via the kitchen that the gas man may keep and increase his sales of gas per meter and it seems that where such pages are not available for his use he would promote one.

This is a pleasant and profitable job for the Home Service Department, and one which should not entail a great deal of effort.

A COMPELLING AD

Speaking of advertising; here is another clever example of Miss Lois Upshaw's advertising, from one of the Dallas Texas Newspapers. This kind of advertising will be read by women and the things suggested by the advertisements will be tried-out.

Of course, there's hardly a cook alive who has not at sometime or another said, "doggone, I wish I knew what I didn't do to make that cranberry sauce stand


Non-collapsible cranberry sauce . . . .
SUNDAY night we had supper at a certain house in town famous for its cranberry sauce. You can cut it with a knife, it stands so firm and slick. It glistens like strained jelly, and has a fascinating flavor of the whole fruit.
On behalf of our friends whose cranberries collapse in spite of everything, we secured the prize formula, and hasten into print herewith:
Speedy Technique
The secret is in short cooking. You must work fast to keep it from going limp.
1 quart (1 lb.) cranberries
2 cups of sugar
2 cups of boiling water
Place berries in the boiling water, where they promptly start popping. Cook 6 to 8 minutes by the clock, and turn off the heat.
Press fruit through a sieve and add sugar. Place on fire and stir faithfully with your wooden spoon until the mixture is rolling in a bubbling boil. Turn off the gas and pour your sauce into glass or earthenware molds.
THE DALLAS GAS COMPANY
Dispensers of Natural Gas

up." Here Miss Upshaw tells 'em and we'll bet that Dallas used more gas to prepare "Non-collapsible cranberry sauce" the day after the ad appeared than it had in any previous sixteen Thanksgivings, to say nothing of all the Christmas days and New Year Days thrown in.

The Home Service Contest

By Ina B. Rowe

WEBSTER defines "contest" as "an earnest struggle for superiority", and then goes on to tie the word up to "battle", "conflict", "fright", "dispute", and "contention", or "any struggle, whether friendly or hostile, for a common object". Webster evidently does not hand a contest any too much. He may have tried to conduct a few.

It is perfectly true that some contests may merit one or all of these uncomplimentary descriptions, but at the same time they may be made so useful that it is unfair to condemn the whole idea in a wholesale manner. If worked into a home service program in the proper way, "a friendly struggle for a common object" may prove of great value. Nor is it so difficult to keep it friendly.

To plan a home service contest which will be economical and also interesting is not so simple a matter as might first appear. They may become one of the most costly forms of interest-go-getters, without the extra costs showing up against the contest itself on the balance sheet, but cutting into the company's profits, none the less. The prize is one of the least important items in expense, and the prize happens to be about the only item of cost which can be definitely determined in advance.

Contest Subjects

Other equally important items are time, materials, publicity, and, if not handled skillfully, the cost in public relations, as a contest may defeat the very purpose for which it was undertaken.

The following have been made the subject of home service contests in one company or another:

1. Guessing the temperature of a heat-controlled oven.
2. Submitting a favorite recipe or menu for a specified food or meal.
3. Suggesting a suitable name for a new food or recipe.
4. Offering a descriptive name, slogan, or emblem for the home service room or department.
5. A school essay contest.

The subject for a contest will probably be selected according to what you wish to get out of it. The temperature-guessing contest is a publicity stunt and only that, especially applicable to a range selling campaign, and ties in more logically with the selling program than the home service program. The recipe or menu contest has a certain practical value aside from publicity. Although a department has many contributed recipes and numerous sources for finding others, it is constantly looking for something new, practical and original.

On the other hand, most of the recipes entered in the contest which are not eliminated before the final selection have to be tested in order to make the decision a fair one, and to the cost of the prize must be added the cost of the director's time and the cost of materials used in testing.

A contest for giving a name to a new kind of cake or other food may have a practical purpose. You may really want that cake which you have just invented christened suitably. On the other hand, the request for a name may be only a blind to get the department before the public in a desirable way. If the rules of the contest require that the cake be baked by every one who competes, there may be an added load put on the lines, an increased interest in regulated oven heat, and a new recipe added to the tried-and-true ones with which the housewife is already familiar. These last advantages are hypothetical, and there is no way of actually measuring them. Because this contest required no testing of recipes or tasting of food, it finds favor with home service directors.

The contest for a name, slogan, or design for the department usually has a practical object, particularly when the department is new. Here, again, you intend to make use of the contribution to which you give the prize. The publicity feature is incidental, but valuable, nevertheless.

Most people who have had experience with contests particularly avoid those which bring the actual food into the scene, whether it be through the testing of recipes by the home service department or the judging of food which other women bake and bring in. A judge at such a contest needs as much diplomacy as a judge at a baby show. At least a few of the patrons who do not get prizes are sure to feel unjustly treated. If cakes are brought from the homes for the contest, they must be broken or cut for the judging and this to some extent spoils their appearance for other uses. This kind of a contest may be just the thing for a county fair, but it is seldom welcome on a home service program. If it is combined with a cake sale put on by a local society one undesirable feature may be eliminated as a way is provided for thriftily disposing of the unsuccessful entries. It may also be worked out successfully in co-operation with a school cooking class engaged for the moment in cake baking.

Plan Ahead

One of the first rules of staging a contest successfully is to have the entire plan completely worked out before hand. This makes it much easier for both the contributors and the judges. If the rules, then, are not followed, many an entry may be thrown out on those grounds, and the actual number which come up for final selection will be small. These rules should not be severe or hard to follow, but there is no reason why a home service director should have to pass judgment on a recipe, for example, that comes in as a clipping from a hand written letter, with unrelated material on the back of the sheet, and the writing scarcely legible, even though the recipe itself may merit consideration. Every home service department has a more or less well established form for getting out departmental material. It is a courtesy to the department that contestants submitting material use the same form. A suggestion incorporated in the announcement of the contest to bring out this point will not be amiss. Neither will it reduce the number of entries. It will, however, make the judging easier and more mechanical, and therefore less likely to have an unpleasant after effect.

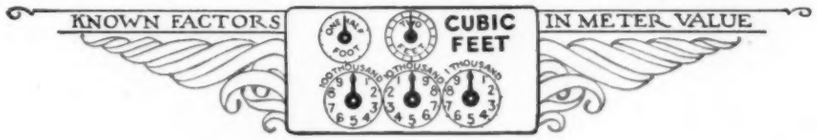
Handling Prizes

The matter of prizes is important. A number of small prizes in addition to one or two which are really worth while adds much to the publicity value of the contest without increasing the cost to a great extent. When the contest is decided the names of the winners are usually published in the local papers, or at least in the company's publication. "Names is names in the newspaper business," as one editor expressed it. They have great news value. The report of the contest may resemble a comet, with the satellite leading and the winners of insignificant prizes trailing along in the wake. If the insignificant prizes are some of the infrequently used small gas appliances, such as a toaster or a corn popper, they may have some load building value in addition.

Out of a contest the sales organization may get valuable leads or prospects. It is diplomacy to have it understood beforehand just how far the names of contestants are to be followed up with sales effort. If the home service department has remained aloof from sales, it may seem like a breach of faith to use the contest in this way. On the other hand, if the home service department makes a definite effort to support the selling program, contestants should expect this contact.

Every contestant is not a prospect however. In one contest conducted in connection with a range sale, although there was no limitation put upon the sales force as to the use they might make of the lists, the sales results were negative. Visits to the homes showed that of the three hundred and fifty who entered the contest, very few were in the market for ranges. They had good ranges and were proud of their cooking.

In this particular contest, however, although it paralleled a range campaign, a range was not offered as the prize. Had it been, the contest lists would no doubt have reflected to a much greater extent the interest in new ranges, and would have been of greater value in the problem of the moment. Many times a manufacturer,



THE LINDERMAN ORIFICE METER

A New Standard for the Accurate Measurement of Gas in Large Volumes

The Growth of American Meter Manufactories

*****

New York
1836

Philadelphia
1848

Albany
1855

Boston
1860

Baltimore
1866

Erie
1888

Chicago
1896

San Francisco
and
Los Angeles
1901

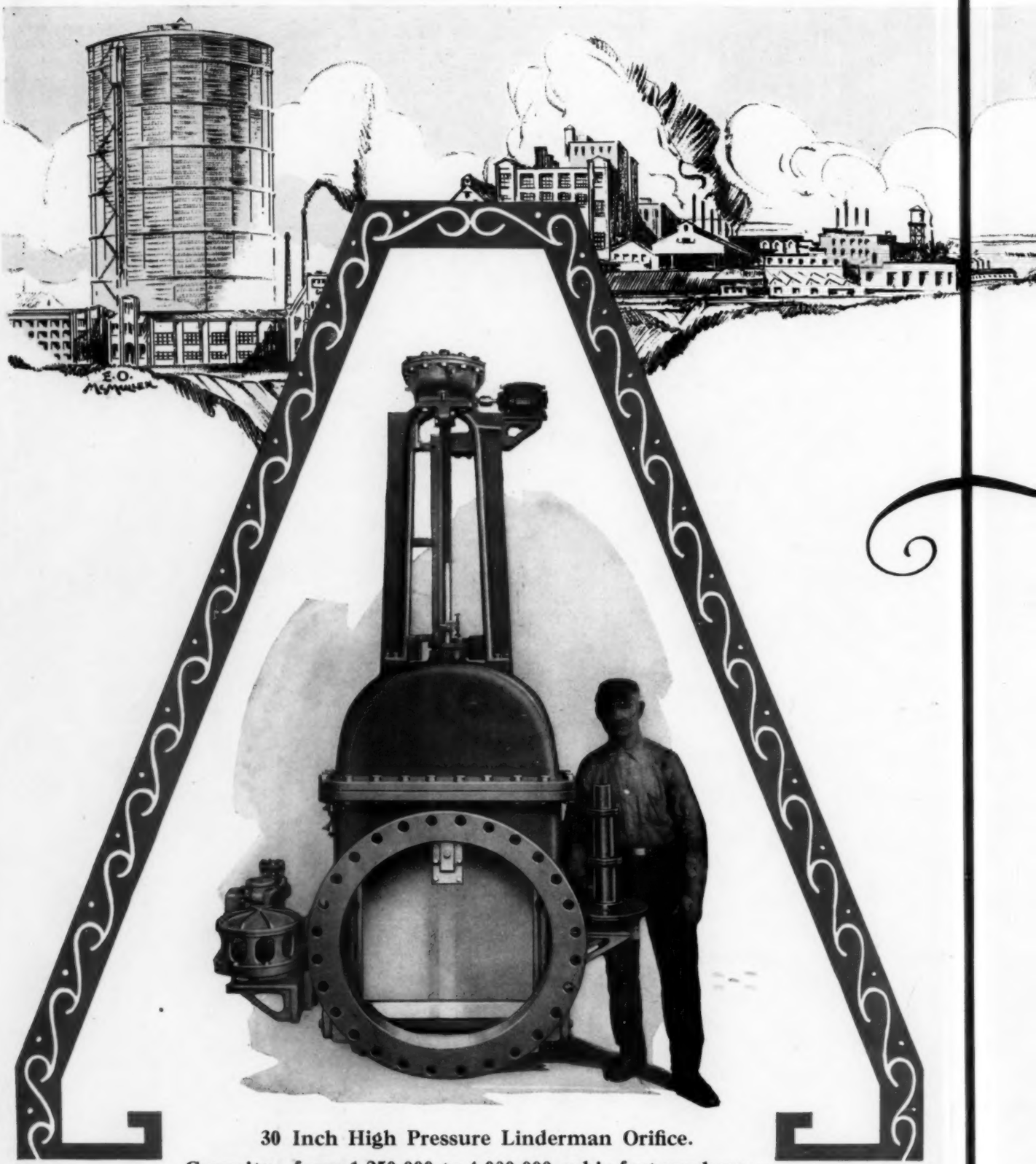
Kansas City

ONCE again, American Meter Company has succeeded in making a notable contribution to Gas Measuring Requirements. The Linderman Orifice Meter— invented by Garrett B. Linderman, Jr.— is presented on subsequent pages. It has proved conclusively its value and importance in the field of Large Volume Measurement.

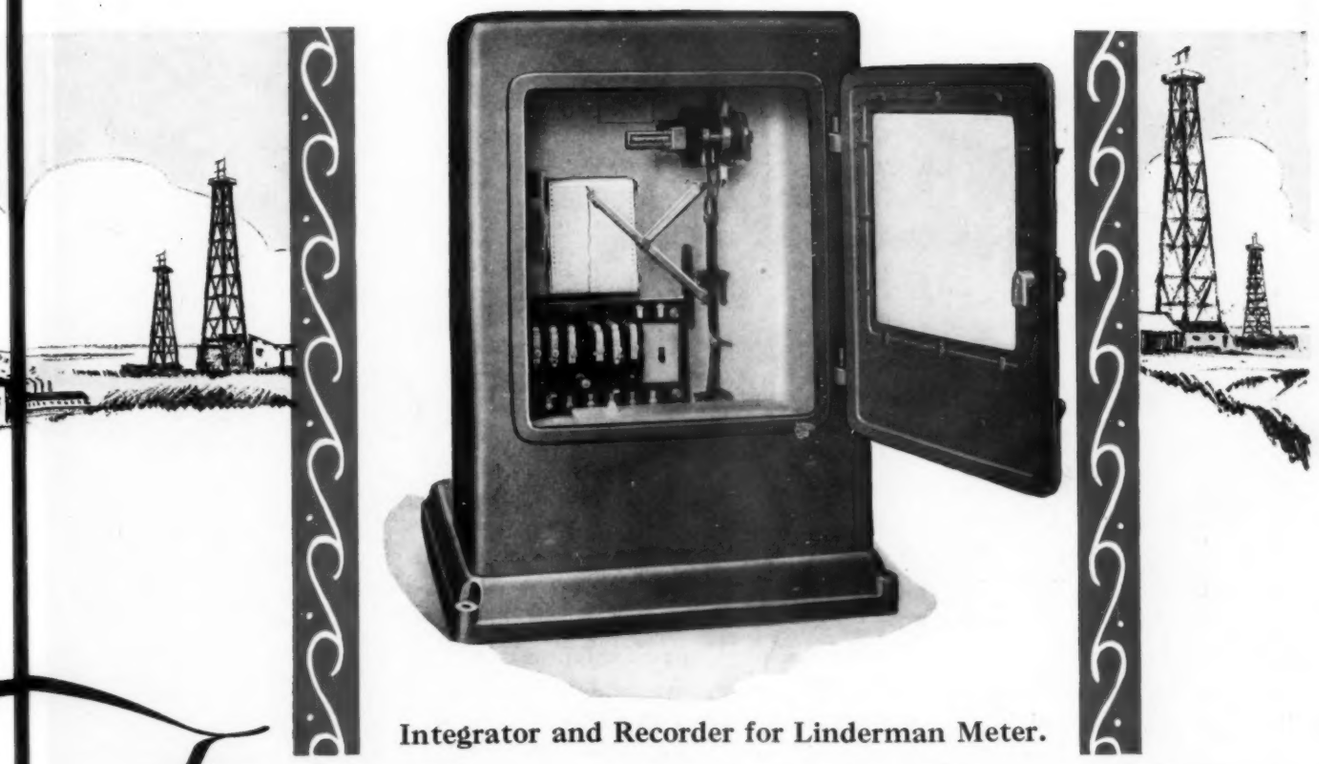
More than four years of experimental research and practical test in service have demonstrated that the Linderman Orifice Meter is unsurpassed in serving the purpose for which it is designed and constructed.

It is built on sound principles, skilfully adapted to the accurate measurement of gas in large volumes under conditions generally obtaining in a modern gas works.

AMERICAN METER CO. MEASUREMENT ENGINEERS CUBIC FEET



30 Inch High Pressure Linderman Orifice.
Capacity—from 1,250,000 to 4,000,000 cubic feet per hour—depending upon initial pressure.
Pressures up to 100 pounds per square inch.



Integrator and Recorder for Linderman Meter.

The Linderman Orifice Meter

Features

1. Range from zero to full capacity of METER.
2. Corrects for Temperature, Pressure and Specific Gravity.
3. Direct Reading.
4. Small space required.
5. Can be installed in any position.
6. Graphic Record of rate.
7. Economical to operate.

The Linderman Meter can be furnished for 8-inch, 12-inch, 16-inch, 24-inch and 30-inch pipe sizes. Capacities range from 25,000 to 1,250,000 cubic feet per hour on low pressure—from 30,000 to 4,000,000 cubic feet per hour on high pressure.

METRIC METAL WORKS
ESTABLISHED · 1888 ·
· ERIE · PENNSYLVANIA ·

LINDERMAN ORIFICE METER

Guaranteed Accurate to Within One Per Cent from Zero to Full Capacity

Description

THE Linderman Meter is of the orifice type, in which the measurement is obtained from the size of the aperture. It is made up of a main body casting similar to a large gate-valve, a controller, and an integrator. The orifice or gas way has a sliding gate, movable across its face, and is calibrated for all positions of the gate.

A centrifugal blower is provided as part of the integrator, which develops a pressure proportional to the density of the gas. This pressure is transmitted to the controller, which consists of four interconnected chambers containing a liquid, and one float which operates two contacts, which in turn control the motor operating the gate. The chambers of the controller are so designed that the gate is kept in such a position, in relation to the flow of the gas, that the coefficient is maintained proportional to the rate of flow of the gas through the meter, irrespective of any change in the specific gravity, the temperature or the pressure of the gas.

The integrator consists of a vertically reciprocating member, the vertical movement of which is limited by the surface of the cam. The surface of this cam is so cut that the drop on the cam is proportional to the calibration of the orifice. It is connected to the sliding gate by a flexible shaft which rotates it so that proper calibration is always directly under the reciprocating member. In other words, the movement which this member is permitted to make is maintained proportional to the coefficient of the orifice, and hence to the flow of the gas. This movable member is operated by a small electric motor every ten seconds, and its movement is integrated through a double roller ratchet (in which there is no slippage) and is recorded in cubic feet on a direct-reading index.

The meter is guaranteed accurate to within one percent from zero to the full capacity of the meter.

For complete information on the Linderman Meter— write to Metric Metal Works

METRIC METAL WORKS
ESTABLISHED 1888
ERIE · PENNSYLVANIA

eager to tie in with the home service program, will donate a range to be used as a prize, writing the cost off to sales promotion.

The judging of a home service contest naturally falls chiefly upon the home service director, but she usually prefers to have her name in the background as much as possible. The more closely she is acquainted with the contestants the more difficult it is for her to form an unbiased judgment, and her choice is the less likely to be accepted without question. Usually she makes at least the first elimination, and she may guide the final choice to a great extent, but if nominal judges can be chosen from disinterested and influential outsiders, there is less opportunity for unpleasant reactions. If a weighted or mathematical average is arrived at, the personal equation is still less important.

A contest will be reasonably free from snags if the following points are decided beforehand, and incorporated in the announcement of the rules:

1. The specific thing that is to be submitted. The more definite this can be made, the less trouble the judges will have and the more help will the rules be to the contestants.
2. The general rules, such as
   - One side of the paper only
   - Name and address on the back of each sheet
   - No company employees nor members of their families
   - Maximum length if the contest is of the essay type

   Form, if recipes, such as (a) ingredients, (b) method, (c) time and temperature of baking, (d) standard measurements..
3. No comments unrelated to the subject of the contest.
4. Standard upon which judgment will be based, such as (a) originality, (b) economy, (c) health features, (d) ease with which it can be made, (e) general practicability, (f) universal language of recipes and measurements, (g) general appearance, and printibility without a great deal of additional editing.
5. Date and hour of closing.
6. Judges.
7. Prizes to be offered with rule which will govern in case of a tie, such as (a) equal division among winners, (b) duplicate to each, (c) first successful contestant to be named the winner.
8. Disposition of material submitted, whether it becomes the property of the department or is to be returned to the contestant.
9. Name and address of person or persons to whom entries are to be sent.
10. Signed statement that certain conditions of entry have been met, if there are such conditions, using a certain recipe or certain ingredients, or actually baking a cake which is to be named in the competition.

If some time and thought is given to the most important of these points suggested, the saving in time and trouble later on will be well worth while.

Plummer, Pilot and Plane—the "We" of a unique Cooking School Plan

Plummer Piles In The People

Flying Chef Cooks With Gas In Prudence Penny's Kitchen

By Special Correspondent

ONE of the most unique cooking school plans ever attempted was recently put into action by W. L. Plummer, the Flying Chef, and Southern representative of the George D. Roper Corporation. Mr. Plummer, a captain in the Aviation division of the U. S. A. Reserves and a former instructor of stunt flying, arranged with the Chattanooga Gas Company, the Birmingham Electric Company, the Mobile Gas Company, The Georgia Power Company and number of other companies in Dixie to stage a cooking school and gas range demonstration. These demonstrations were held for one and two day periods, and were called "Flying Chef Sales."

Here's the way they were planned and carried out. Arrangements were made by Mr. Plummer with the gas companies

. . . And now, even the Chefs are taking to the air! A real, honest-to-goodness Flying Chef will arrive in Atlanta in just a few days . . . and his short visit will be of interest to the women of Atlanta. Be on the lookout for him . . . and watch this newspaper for the date he will drop from the sky with his message to Atlanta's housewives.

One of the Small Teaser Advertisements used

to stage the sale, and when the plans were all set the "advance notice" was given by way of small teaser advertisements in the newspaper which said; "Coming, The Flying Chef—The Sensation of the Century. Note to the Ladies: Watch this paper for Landing Announcements." These little teasers were scattered throughout the papers for two or three days. Then they were enlarged to more teasers with a little more information and in turn these were followed with full page advertisements telling the whole story and inviting the women of the city to attend the demonstration.

In Atlanta, the Georgia Power Company and the Atlanta Georgian and American put the Flying Chef in the foreground and staged a demonstration in Prudence Penny's Health Kitchen as well as the Home Service Kitchen of the Georgia Power Company.

The sale with its advertising from the air, its chef who flies in an honest-to-goodness bi-plane with the words "Cook With Gas" painted upon both sides of it, and its toy planes distributed to the Kiddies, is all that is new and timely today, and the newspapers gave the stunt a generous lot of news space both on the day Mr. Plummer arrived in the city and during and after his stay. In Atlanta Prudence Penny, who is renowned as a cook, gave the readers of her famous cooking column several of Mr. Plummer's recipes and a generous amount of publicity.

When the flying chef landed in a city "he was invariably met by a huge throng of housewives" and "a reception committee of local hostesses would also greet him and speed him away" to the place selected by the gas company for the demonstration (in some cases it was necessary to hold the demonstration in an auditorium to accommodate the crowd). Arriving at the place where the demonstration was to be held the Flying Chef pitched right in and in his own inimitable way prepared and demonstrated his own pet recipes, and you may rest assured this was well received and the foods were eagerly sought for by the housewives present.

The Flying Chef left no stone unturned to bring to the attention of every woman in the cities visited that he had arrived, and aside from newspaper advertising announcing the fact he dropped toy airplanes from the sky as he flew over the city. And judging from the number of women that turned out to every one of his demonstrations there can be no doubt that if the home managers had not read about the Flying Chef's coming the kiddies brought the fact to their attention after they had secured an air-ship from the clouds.

This campaign and these sales have a most wonderful advertising value, not alone for the Roper Range and the local gas companies in the cities visited, but for the industry as a whole. They pound home the fact that gas, after all is said and done, is the ideal cooking fuel, and especially so when brought to their attention from the air. This company is certainly putting "cook with gas on the air and in the air" and the next thing we know we will be getting "cook with gas" via television as we set at our dials at home.

It is understood that with the coming of Spring several more of these speedy sales will be put on over the country, which, by the way, brings out this point; these demonstrations are conducted not to sell a great volume of ranges in a short time and then lay off effort for three or four months, but are planned to arouse sufficient interest to keep range sales coming in until the versatile Flying Chef works out a new plan—and isn't that as it should be in this day of specialization when we have to exert the "new" constantly and continuously to keep our per meter send-out?

Presenting A Prettier Picture With The Gas Advertising

How Gas Advertising Men — and Women — Improve Appearance of Displays to Compete With Improved National Advertising in Newspapers

By Wallace Piper

LOCAL advertising, as a rule, presents a less pretty picture, for a number of understandable reasons," said an editorial in Editor and Publisher, praising the improved appearance of national advertising in the newspapers.

Inasmuch as the gas company's advertisements are appearing alongside these same improved national advertisements, still more attention must be paid to the appearance of gas advertising.

1
it's easy, folks—
to keep in
hot water
even though the coalpile is getting low. Have hot water always handy—install a self action gas water heater now—no need to fire up just to heat water, yet hot water will be at every faucet—plenty of it—when you want it!
Install Now
Small Down Payment
Pay Nothing
Balance Monthly
'till April!
Let us show you the difference between hot water and hot water service. Try a heater free for one month. Come in and see these heaters; learn of their economical use. Enjoy the convenience of enough hot water whenever you want it!
NORTHERN INDIANA PUBLIC SERVICE COMPANY

How they do it in the Mid-West

"The small business man who uses the local space has usually nebulous ideas regarding advertising and few, if any, on typography," continues the editorial.

"Not many newspaper printers have been produced during the past twenty-five years with the sense of craftsmanship that distinguished their predecessors.

"Time is the all-important factor in newspaper production and too often it has been none too abundant in the composition of newspaper advertising.

"None of these conditions are incurable. Newspaper printers can be trained in typography at small expense of time and money. Advertisers can likewise be educated, not only to appreciate good typography, but by giving the newspaper time to produce it."

No, it is not necessary that each gas company should hire what somebody has called a "$10,000-a-year typographical landscape gardener."

As a matter of fact, the simplest and most easily remembered principles of good newspaper advertising are the ones that are violated most frequently. Advertisers make, or rather let the newspapers make, the same mistakes over and over. And, strangely enough, there aren't enough of these important principles to make a wrinkle on anybody's brow.

You can get a good start toward attractive advertising with three rules—white space, no masses of capital letters and no confusing mixtures of type-faces.

Why are so many gas advertisements, especially in the smaller cities, set in violation of these simple rules?

Take the first—white space. So many times the gas advertising man does not allow room for white space and yet the very idea of a clean-looking advertisement is symbolical of gas. Too much copy—too many words—is written and the printer must fill the space entirely with type.

He will get better results by cutting a piece of white paper the exact size of the space to be used and then pasting it on the page of the newspaper in which the advertisement is to appear.

When he sees how crowded the rest of the page looks, he will appreciate how much more striking his advertisement will be if it has a generous frame of white space around it or otherwise shows large areas of white in it.

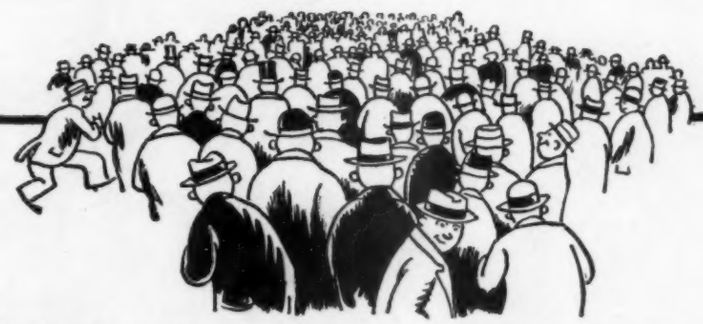
Some successful advertisers leave at least 20 per cent of white space in their adertisements and often more than that.

Second, consider the "masses of capital letters." This is a fault that ought not to be found in advertisements for the very simplest of reasons. Reading a lot of capital letters is one of the hardest jobs offered the human eye. If you want to verify this, go to the circulation mana-

REDUCED PRICES

On Welsbach HOT ZONE

SELF ACTION GAS WATER HEATER



THE WELSBACH POLICY has always included a consistent effort to increase the gas company market for Water Heaters. This new price revision is another long step forward . . . All Welsbach Water Heaters may be had with or without safety gas shut-off and temperature-pressure relief valve.

Confidential information concerning the newest addition to the Welsbach Water Heater family may be had in advance by writing Welsbach Company. Do not complete your new season's contracts until you have read these interesting details.

WELSBACH COMPANY
GLOUCESTER CITY, N. J.
Branches in Principal Cities

Member
American Gas Association

The Best Little
TOASTER
Sold regularly at
40 cents each
Special Offer Now
2 for 39¢!
Tear out this advertisement and bring it with you, or use special coupon in Peoples Gas Gazette. After all, if you want the best toast—crisp, golden, just the way you like it—there's nothing to equal the convenient gas flame. You can regulate your heat—slow, fast or medium—as you prefer. Get two "Best Little Toasters" now for less than the usual price of one! Don't be too late!
No mail or telephone orders accepted.
Peoples Gas Stores
Michigan Avenue at Adams Street
and 13 NEIGHBORHOOD STORES

Telling 'em in Chicago

ger of a newspaper and try to convince him that he will sell more papers if he will have all the news set in all-capital letters.

Then why are so many gas advertisements set with so many capital letters?

Because many publishers are unwise in cutting composition costs. This was explained by J. L. Frazier, in Inland Printer. There are type-setting machines which can set the whole advertisement in handsome and harmonious type. Many publishers have "caught the fever" for machine composition but are trying to do it with machines that do not have large enough type for display advertising. As Mr. Frazier points out:

"Sometimes—yes, often—the perpetrators of these advertising abortions know that they are wrong. Realizing that this body type is wholly inadequate, they often set the advertisement wholly in capitals, which although, bulking out the matter, makes a bad matter worse.

"Everyone knows, or should be able to learn by seeing, that a mass of capitals might almost as well be a mass of hieroglyphics so far as the reader is concerned. If advertisements are not inviting and do not look easy to read they will not be read, and if they are not read the advertiser will not get results. If he doesn't get results, how in Sam Hill can the publisher expect to increase the volume of his advertising."

Third, little comment is needed about "No mixtures of type-faces." When you let the printer put in a little of this and a little of that—well, in automobile language, "Why make the reader's eyes shift gears so often."

Yes, it's too bad that the gas companies must battle with what seems largely a publisher's problem. But advertising is necessary, and that some gas companies are solving the problem and making their advertising present a prettier appearance is shown by the accompanying examples.

Use your sunshine more!
ABOUT this time of year many people in the North pack up and strike out to find the sun.
Zip . . .
In the meantime, Dallas stays on a direct line to the sun, and has some good winter to boot . . . high-spirited days with a zip in the air. Since no smoke barrage hangs over this city, the sun comes straight to your doorstep, loaded with stimulating rays that build health and make children grow.
Free Violet Rays . .
USE your sunshine more! It is a free and luxurious tonic, and can whip a common cold to a frazzle.
Dallas gets its natural gas in four directions from independent fields, an immense supply for the city's industry, commerce and homes.
THE DALLAS GAS COMPANY

An interesting appeal

Miscellaneous Publications

The Classification of Coal, by Samuel W. Parr. Engineering experiment Station Bulletin 180, University of Illinois. Available from the University at Urbana, Ill.

The Thermal Expansion of Fireclay Bricks, by Albert E. R. Westman. Experiment Station Bulletin 181, University of Illinois. Available from the University at Urbana, Ill.

An Investigation of Checkerbrick for Carbureters of Water-Gas Machines, by by C. W. Parmelee, A. E. R. Westman, and W. H. Pfeiffer. Engineering Experiment Station Bulletin 179, University of Illinois. Available from the University at Urbana, Ill.

A laboratory Furnace for Testing Resistance of Firebrick to Slag Erosion, by Ralph K. Hursh and Chester E. Grigsby. Engineering Experiment Station Circular No. 17. University of Illinois. Available from the University, Urbana, Ill.

Report of the Fuel Research Board for report of the Director of Fuel Research. (British). Issued by the British Department of Scientific and Industrial Research. Available at 1s. 3d. net from H. M. Stationery Office, Adastral House, Kingsway, London, W.C.2, England.

Investigations of Fuels and Fuel Testing, 1926. Publication No. 689 of the Mines Branch, Department of Mines, Ottawa, Canada. This publication contains chapters which are technical articles on the following subjects, among others: Low-temperature carbonization, nature of sulphur in Canadian coal, air drying of lignite, analyses of solid fuels, instructions for burning of solid fuels.

PERMANENT VALUE
. . that's my BUDGET for 1929
"I AM RESOLVED," said Mr. F., "that our household budget this year shall contain at least one or two purchases of permanent value—things that we can enjoy for many years to come.
"The Gas Company has a number of interesting offers—a new automatic gas range and a silent gas refrigerator for Mrs. F.; also an automatic storage water heater and gas furnace that will certainly make life easier for me. I can buy them on installments, just like a piano or an automobile. That's what a budget is for.
"Guess I'll send in this coupon and find out how I can fit them into my household expenses."
VISIT the Exhibit of Modern Gas Equipment at our new Display Office, 101 Park Ave., (entrance 104 East 41st Street)
Ask Your Gas Company
CONSOLIDATED GAS COMPANY of New York
GEO. B. CORTELYOU, President
(USE THIS COUPON)
4 Irving Place, New York—Room 1523
Gentlemen: Please send your representative to answer my questions about the items specified below:
☐ House Heating ☐ Automatic Ranges
☐ Water Heating ☐ Gas Refrigeration
Please mail descriptive pamphlets
Name
Address

How's your Budget?

GLOVER-WEST
Vertical Retorts

An aerial view of the
Pawtucket Gasworks of
Stone & Webster, Inc.
showing the
GLOVER-WEST VERTICAL RETORTS

WEST GAS IMPROVEMENT CO.

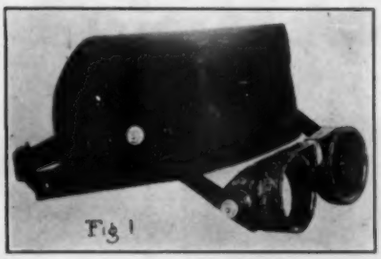
Builders of Coal Gas Plants

441 Lexington Ave. New York

Equipment News

Oxweld Helmet Goggles

Accessories for welding and cutting recently added to the line of the Oxweld Acetylene Co., 30 E. 42nd Street, New York City are the Oxweld Cap and Skeleton Type Helmet Goggles.



The No. 9 Cap Type Goggles, Fig. 1, consist essentially of a strong fibre cap to which a pair of goggles are attached by means of fibre links. The goggles can be readily raised over the forehead or lowered over the eyes with one hand. The bridge is adjustable and is covered with rubber insulation. Replaceable lenses, in the same size and colors as are supplied in Oxweld No. 6 goggles, are used, the colored lenses being protected by cover lenses of clear glass. The No. 10 Skeleton Type Goggles, Fig. 2, are the same except that the Goggles are attached to a lattice skeleton cap. Both styles are provided with leather straps at the rear for head-size adjustment.

These Cap and Skeleton Type Goggles furnish adequate protection and are very durable. Welders who have used them claim they are extremely comfortable and convenient.

Quigley Gun for Applying Emulsified Asphalt and Emulsified Asphalt Mixtures

The use of Emulsified Asphalt and Emulsified Asphalt Mixtures has become so general as a coating for metal, concrete, stone, brick, cork and other surfaces that the application of these materials has become a most important problem.

Hand application of material where mechanical application is possible, is both slow and costly; nor can the same penetration or adhesion be secured when applied by hand as when mechanically applied.

The Quigley Gun is piston-actuated and material is extruded from the cylinder by air pressure admitted under the piston, insuring constant and steady delivery of the mixtures to the nozzle, in their original form and consistency, through hose of any reasonable length.

Its capacity is 2 1/10 cubic feet (15 2/3 gallons), and air pressure required under the piston may be varied according to consistency of material. The air required to operate the Gun is 24 cubic feet per minute of free air at about 80 lbs. pressure, so that a compressor having a capacity of 27-30 cubic feet of free air at 80 lbs. per minute should be available.

Some of the features claimed for this equipment are as follows:

The nozzle is so arranged that absolute control of application can be had, and the operator by simply releasing his grip on the trigger can automatically stop the discharge of material, and without waste.

The large orifice will not easily clog, and if nozzle is dropped to the ground or dirty floor during any operating period it will again function freely when taken in hand by the operator. This permits the operator to leave the gun or nozzle

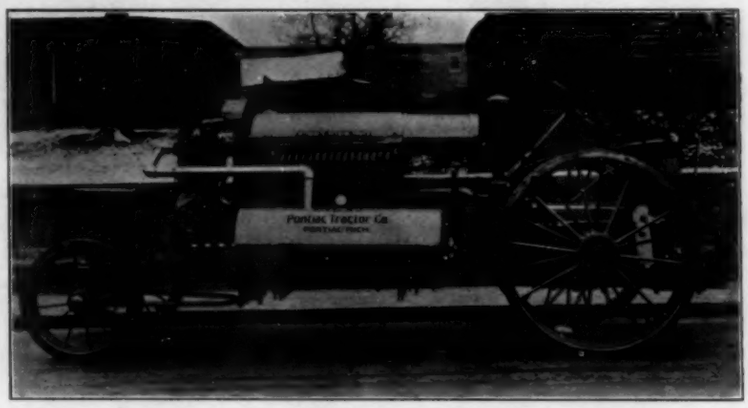
for the purpose of inspecting work or for refilling the Gun at any time without making special preparation.

Complete details will be sent upon application to Quigley Furnace Specialties Co., Inc., 26 Cortlandt St., New York City.

New Backfiller Winch

A Backfiller Winch which operates in connection with the McCormick-Deering 10/20 Tractor, has been announced by the Pontiac Tractor Company of Pontiac, Michigan, manufacturers of the Pontiac Air Compressor and the Pontiac Lincoln Arc Welder. These units make a clean one unit designed, Self Propelling machine, with the draw bar free for hauling other equipment. The Backfiller Winch is designed to mount with either of the above units and when mounted with the compressor, allows the operations of backfilling and tamping at the same time. This unit can be used for a variety of purposes.

The Winch has a single drum with brake and takes its drive from the Power Drive Shaft at the rear of the tractor and is mounted on the frame at this point. The unit, it is claimed, can be operated from either side of the tractor and is controlled from the drivers seat.

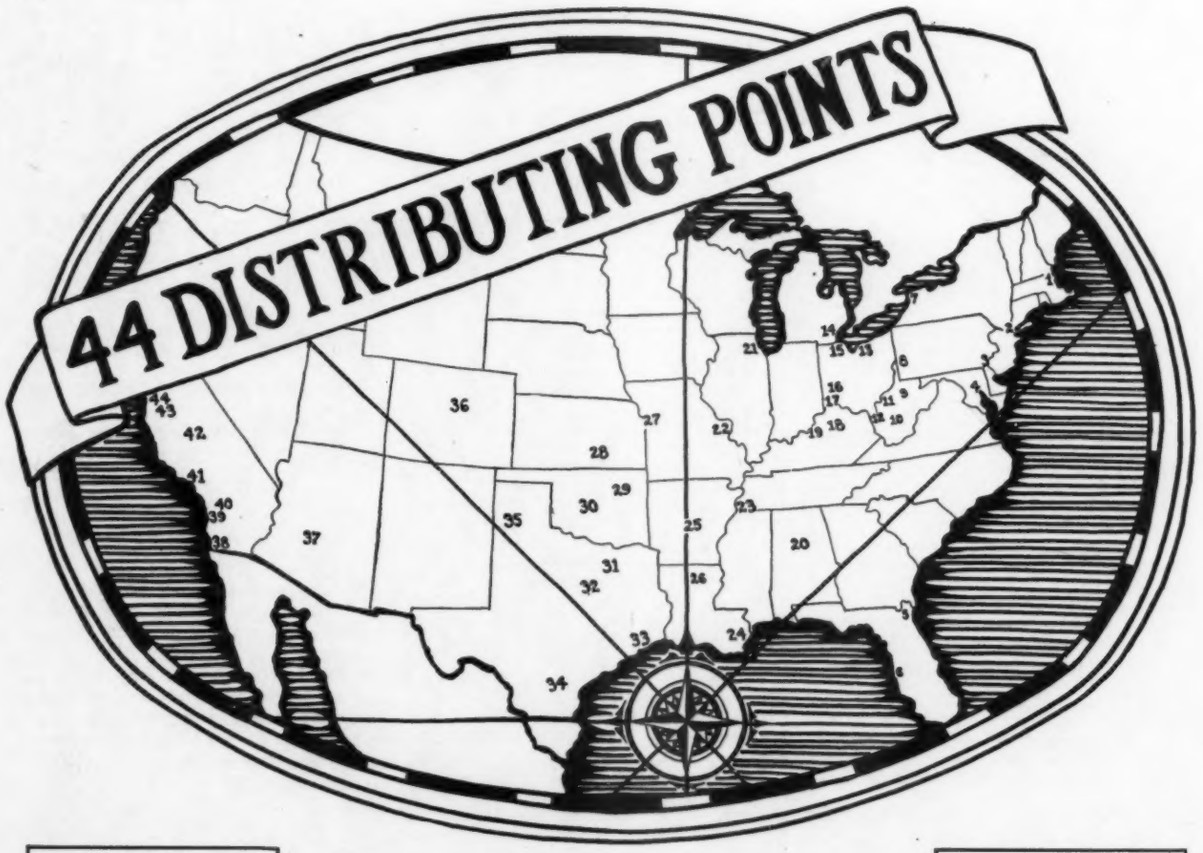


Renrut Service Cleaners

Safety Gas Main Stopper Co., 523 Atlantic Ave., Brooklyn, N. Y., have recently brought out the Renrut Service Cleanser, which is a development of Nos. 34 and 35 Cleansers. This apparatus is constructed of high tensile brass throughout, has been tested to 500 lbs., per sq. in., is one-man operated and weighs 13 lbs.

The following improvements are claimed:

1. Increased Length of Pump Stroke. This lengthened stroke enables the pressure to be attained with even greater ease and speed than with the No. 34 Cleanser, 300 lbs. pressure can easily be attained in 2½ minutes if required.
2. Larger Capacity. The cubical capacity has been considerably increased, enabling very long services to be easily cleared.



1—Boston, Mass.
2—New York City, N.Y.
3—Philadelphia, Pa.
4—Baltimore, Md.
5—Jacksonville, Fla.
6—Tampa, Fla.
7—Buffalo, N. Y.
8—Pittsburgh, Pa.
9—Clarksburg, W. Va.
10—Charleston, W. Va.
11—Parkersburg, W. Va.
12—Huntington, W. Va.
13—Cleveland, O.
14—Detroit, Mich.
15—Toledo, O.
16—Dayton, O.
17—Cincinnati, O.
18—Lexington, Ky.
19—Louisville, Ky.
20—Birmingham, Ala.
21—Chicago, Ill.
22—St. Louis, Mo.

They Mean *Service* to Gas Companies

Clow Gasteam Distributors thoroughly cover the country—from Manhattan to the Gulf, or to the golden shores of California. Which means there is a Gasteam Distribution point close to every gas company.

Gas companies can get *service* on Clow Gasteam Radiator shipments or parts.

Above are shown the 44 Gasteam distribution points — and each year they grow in number — for each year Gasteam users grow to Gasteam boosters.

23—Memphis, Tenn.
24—New Orleans, La.
25—Little Rock, Ark.
26—Shreveport, La.
27—Kansas City, Mo.
28—Wichita, Kans.
29—Tulsa, Okla.
30—Oklahoma City, Okla.
31—Dallas, Tex.
32—Fort Worth, Tex.
33—Houston, Tex.
34—San Antonio, Tex.
35—Amarillo, Tex.
36—Denver, Colo.
37—Phoenix, Ariz.
38—San Diego, Calif.
39—Pasadena, Calif.
40—Los Angeles, Calif.
41—Santa Barbara, Calif.
42—Fresno, Cal.
43—Oakland, Calif.
44—San Francisco, Calif.

JAMES B. CLOW & SONS
201-299 North Talman Avenue
Chicago

CLOW GASTEAM

A.G.A. Approved.
Listed and Inspected by
Underwriters' Laboratories

STOCKED IN EVERY SECTION OF THE COUNTRY

3. Improved Base. Three small solid Feet have replaced the stirrup foot, giving much greater stability when not in use. They are also in an ideal position for holding down the pump when in work.

4. Gauge Protector. A Lug has been cast on the Top which efficiently protects the Pressure gauge from damage.

All the best features of the Nos. 34 and 35 Cleansers have been retained, viz.: —Compound Pump enabling the desired pressure to be attained with minimum effort, Piston Instantaneous Release Cock giving maximum clearing effect to the released air, Lightness of Weight and Portability, and simplicity of Renewal of Leathers in own works if required. Strong hand and shoulder carrying straps are fitted. Multiple Brass Reducing Nozzle (if required).

New Eriez Quarter Century Gas Range

The Eriez Stove & Manufacturing Company this year enters into its second quarter of a century of the manufacture of Eriez Gas Ranges.

To fittingly mark this anniversary, no effort has been spared to design and produce a new line of models which will be known as the Eriez Quarter Century models. Features have been included in these models that are unusual, including a simple arrangement of concealed manifold, no bolts in sight on the range, more practical design of Utensil Drawer, larger cooking top and same size top used on ranges with 16 and 18" oven. Self-action broiler, balanced doors with a feature for making possible the adjustment at any time of spring tension.

Standardization of equipment is being strictly adhered to on the new models and although many new features are included, the Eriez Company advise that

many economies in manufacture have been effected.

The Eriez Home Service department will continue to widen its scope of activities of intelligently assisting utility Companies in their educational, public relation, and commercial work.

To support the sales of the new model, the sales department has worked out plans that are unique to be of assistance in the selling of these ranges on retail floors. These plans include a complete display and the use of a motion picture film.

The Eriez Company is completing a new modern foundry building to better enable them to take care of their growing business.

Recent Government Publications

Documents are available at prices indicated from Superintendent of Documents, Government Printing Office, Washington, D. C. Send cash or money order; stamps and personal checks not accepted. When no price is indicated pamphlet is free and should be ordered from Bureau responsible for its issue.

A study of the Less Volatile Oils in Salt Creek (Wyo..) Crude, by H. M. Smith. Bureau of Mines Technical Paper 428. 5 cents.

The Sulphur Problem in Burning Coal, by J. F. Barkley. Bureau of Mines Technical Paper 436. 5 cents.

Measuring the variation of Ground Resistivity with a Megger, by F. W. Lee. Bureau of Mines Technical Paper 440. 10 cents.

Geophysical Prospecting: Some Electrical Methods, by A. S. Eve and D. A. Keys. Bureau of Mines Technical Paper 434. 10 cents.

National Survey of Fuel Oil Distribution, 1927, by E. B. Swanson. of the U. S. Bureau of Mines. Pamphlet prepared by the Bureau of Mines in cooperation with the American Petroleum Institute.

A Visible-Action Continuous-Distillation Apparatus for Laboratory Study of Fractionation, by Ralph H. Espach. Bureau of Mines Serial 2892.

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Engineering Report on Seminole Oil Field, Oklahoma. Mimeographed statement issued by the Bureau of Mines under date of November 14, 1928.

Asphalt and Related Bitumens in 1927, by G. R. Hopkins and A. B. Coons. Bureau of Mines Mineral Resources separate. 5 cents.

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300-Lb. Malleable Iron or Steel Unions. U. S. Government Master Specification issued as Specification No. 580 of the Federal Specification Board, Bureau of Standards.

Industrial Thermometers U. S. Government Master Specification. Available as Specification No. 472a of the Federal Specifications Board, Bureau of Standards, and in printed form as Navy Department Specification 18T7i.

Magnesia Molded Pipe Covering and Blocks. American Marine Standards Committee Specification AMSC 36. 5 cents.

Natural Gas via Truck Lines

While nature, for some reason all its own, does not give citizens of the small cities, or even the large cities in certain sections of the United States the benefits of natural gas and there is not demand enough to justify the erection of artificial gas plants or pipe lines to the smaller places, all of them can now have natural gas, getting a goodly supply via truck, automobile and the railroad.

Here is the story:

NATURAL GAS

now available for country and suburban homes!

Pyrofax natural gas service brings genuine natural gas and a modern gas range to your farm, mountain lodge or suburban home. Pyrofax is real natural gas, highly refined and stored in steel cylinders. Wherever you live Pyrofax natural gas is available to you.

Only a simple installation is necessary. The Pyrofax steel cabinet is placed outside your house, containing two cylinders of this faultless fuel for cooking—approximately six months' supply in the two cylinders. The cost and odor of kerosene, the constant danger of gasoline, the heat and ashes of a coal range are inconveniences of the past to the enterprising housewife who enjoys the pleasure of cooking with Pyrofax natural gas on a modern gas range in a cool kitchen. Pyrofax gas is safe. Pyrofax gas delivery service is dependable. Pyrofax gas is economical and convenient for cooking.

Write or phone us now and we will be glad to explain, with no obligation to you, how you may avail yourself of Pyrofax Purified Fuel WHEREVER YOUR HOME MAY BE.

The Rocky Mountain Radio Corp.
Pyrofax Department
1323-1325 Broadway Denver, Colorado

Dealers: Excellent territory is still open on Pyrofax.

Free Trial Fallacy

A woman told us the other day when we were talking to her about purchasing a carefree water heater that she did not think they were any good, and when asked why she thought that she said; "Well, I will tell you why I think that is so. You know about a month ago the gas company advertised that they would install one of those heaters in your home for thirty days free trial, and if it did not prove satisfactory they would call and remove it, and there would be no cost to you for the trial. Well, two of my neighbors (naming them) took advantage of the offer and just yesterday I saw the gas wagon hauling the heaters away, and I know that if they were any good both my neighbors would have purchased them, for they have everything else in their homes that is up-to-date."

Clean Heat increases Production

Clean gas fuel requires no storage space. The supply is continuous and it entails no advance expenditure. The fuel transportation problem and smoke nuisance are eliminated in the factory or shop where gas is used.

In load melting, die casting or the many other operations involving heat treating, you will find gas the ideal fuel.

Telephone: TRIangle 7300
Industrial Division
The Brooklyn Union Gas Company

Join the Red Cross
Do it in Brooklyn

Talk clean heat

1929

REX PARTNERSHIP PLAN

for Gas Companies

SINCE THE CLEVELAND HEATER CO. started to build water heaters, back in 1905, they have always realized that any development of gas utilization can best be done by working shoulder to shoulder with gas companies.

It is a matter of record that The Cleveland Heater Co. has a large established connection with the gas industry. Gas companies have been selling Rex Water Heaters since way back in 1905. A long history of successful service. For these reasons no other manufacturer of water heaters knows the gas man's problems so well and so fully understands his responsibility.

The Cleveland Heater Co., now, announces the formation of a gas company division for the specific purpose of greater and more intensive cooperation. Definite policies have been adopted and are now in force which make Rex more than ever the most attractive and profitable gas water heater partnership ever offered to you. Outstanding in the 1929 Rex Partnership plan are—

Better Prices

More Sales Cooperation

If you are interested in making a connection with a manufacturer of gas water heaters who talks your language, who has a clear understanding of your problems, who is anxious and able to furnish every cooperation, and who builds water heaters that will be a continued source of profit, satisfaction and public good-will, you are invited to send for—

1929 ***Cooperative Plan***
Price List
Merchandising Plan

THE CLEVELAND HEATER CO.

1900 W. 112th Street • Cleveland, Ohio

A Heater that will deliver a

Faster
PICK-UP
than any other
Storage Heater
28 *minutes*
from a cold start!

IT IS this rapid pick-up that is making the "Pittsburg Monarch" the sensation in the Storage Heater field.

The burner has a capacity of 35000 B.t.u.'s an hour. This is from 40% to 100% greater burner capacity than any other system. But it is not only a large burner capacity that makes this heater a sensation, it is the new theory of low temperature operation and low stand-by cost.

THE "Pittsburg

1 gallon of water for every 2 ft. of manufactured gas

Made and Guaranteed by

The World's Largest Manufacturers of Automatic Water Heaters

THE PITTSBURG WATER HEATER CO.
PITTSBURGH · · PENNSYLVANIA

Stand-by Cost Reduced 40%

SNAP action valve operates on 17 degrees instead of usual 35 to 40 degrees. This temperature variation reduces maximum heat of water from 150 to 132 and still delivers 115 degree water at the faucet at low temperature point. Special Secondary Air reduces flue losses to a minimum.

Radiation loss tests show a 50-hour stand-by without operation. No other heater can show anywhere near this economy.

Decided Gas Economy

ONE gallon of Hot Water for every two feet of manufactured gas.

One gallon of Hot Water for every foot of natural gas.

This performance is from 20% to 30% better than any other storage heater on the market.

Greater Burner Capacity

The new improved noiseless Pittsburg Burner built without troublesome gauge passes 35 feet of natural or 70 feet of manufactured gas per hour. This heater will operate on a 5 light meter.

With this extra burner capacity, you are absolutely safe in using a 25-gallon Pittsburg Monarch System on jobs where 30 to 35 gallon heaters are now required.

Beautiful as well as Practical

THE heater is finished in white enamel with nickel-plated trimmings.

300-lb. test copper-bearing Steel tank.

New Efficient Insulating Material.

Safety Pilot.

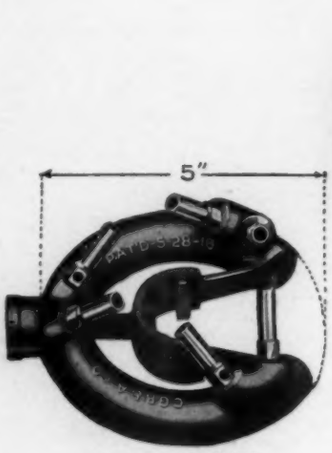
Combination Safety and drain valve.

Delivers more water with less gas consumption than any other storage heater on the market.

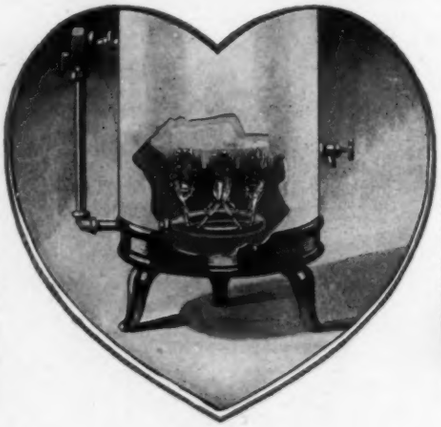
2 Sizes: 25 gal.—40 gal.

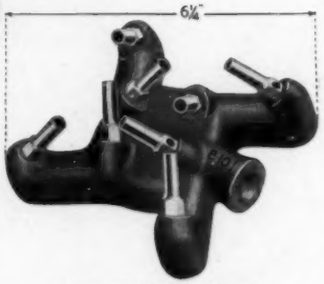
Monarch "WATER HEATER

THE BURNER IS THE HEART OF ANY GAS BURNING APPLIANCE



No. S-80 BURNER





No. Y-10 BURNER

BARBER Patented JET GAS BURNERS

No Water Heater—or other Gas Appliance—is better than its burner. The burner is the "power plant" that furnishes the energy that supplies the service for which the appliance is designed. If the burner fails, the service fails with it — resulting in dissatisfied customers and loss to you.

Look inside the Water Heater! If it is equipped with a Barber Burner, you may rest assured that its "power plant" will never fail.

Among the many Manufacturers who have adopted Barber Burners as standard in their Water Heaters, and other Appliances are the following:

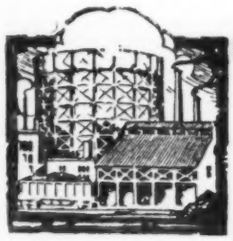
Akron Equipment Co.
American Radiator Co.
Arthur & Fowler Co.
Bean Spray Pump Co.
Bryan Steam Corp.
Carrier Engineering Corp.
Carrier-Lyle Corp.
Champion Dish Washing Machine Co.
Coast Heater Mfg. Co.
Cole Mfg. Co.
Dahlquist Mfg. Co.
Day & Night Water Heater Co.
Economy Heater Co.
Electro Weld Co.
Firestone Tire & Rubber Co.
Franklin Plumbing Supply Co.
R. E. Fraser & Co.
General Gas Furnace Co.
Geneva Heater Co.
Gewert Mfg. Co.
E. A. Hibbs
Hoffman Heater Co.
Hollywood Water Heater Co.
Hotstream Heater Co.
Hoyt Heater Co.
Edward Katzinger Co.
Lovekin Water Heater Co.
Marlow Manufacturing Co.
McConn-Harrison Co.
Merit Mfg. Co.
Walter Mork Co.
Newall Mfg. Co.
New Way Mfg. Co.
Northwestern Steel & Iron Works
Ohio Heater Co.
Geo. F. Reichman & Co.
Safety Water Heater Co.
Sands Mfg. Co.
Schwab Boiler & Machine Co.
Snap-O-Stat Co.
Star Dee Water Heater Co.
Stinson Sales Co., Inc.
John Tragreser Steam Copper Works
United Heater Corp.
Vernon Edler Corp.
Ward Heater Co.
Weil-McLain Co.
Welsbach Co.
D. D. Wessels & Sons Co.
Williams Foundry Machine Co.
Wise Furnace Co.

TO MANUFACTURERS: The services of our Engineering Department and Testing Laboratory are at your disposal for determining the correct application of Barber Burners to any type of heating device. Write us today.

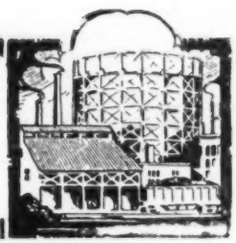
The CLEVELAND GAS BURNER & APPLIANCE CO.

Burner Specialists

3702-04 Superior Avenue, — Cleveland, Ohio



NEWS OF THE GAS INDUSTRY



Natural Gas News In Rocky Mountain Regions

The Teton Gas Products Company, a subsidiary of the Columbia Carbon Company, lost its natural gas contract in the Big Sand Draw field of Wyoming when the gas wells changed ownership and it is now moving its carbon black plant from Riverton, Wyoming, to Amarillo, Texas, where it will be assured of all the gas desired.

Littleton, Colorado, eleven miles from Denver and on the line of the Denver-Amarillo natural gas pipe line has voted a twenty year franchise to the Fublic Service Company of Colorado to serve it with natural gas.

The Western Public Service Corporation is the name assigned to the concern which will build the 300 miles of natural gas pipe line from Wyoming gas fields to Ogden and Salt Lake City, Utah. The Ohio Oil Company, Lone Star Gas Company and some other big concerns are back of the venture. Very little construction work can be done before Spring on account of the snow.

Merger Authorized

Merger of five gas producing companies in and near Greensburg, Ind., with the Hoosier Gas and Light Company, has been authorized by the Indiana public service commission. Companies affected by the merger besides the Hoosier company are the Zoller Gas Company, Muddy Fork Gas Company, Sand Creek Gas and Oil Company, the Citizens Gas Supply Company and the Hoosier Public Utility Company.

Appraisal of the properties was $521,000 as fixed by the commission, whereas officials of the companies set the total value at $797,473. The merged companies were granted permission to issue $150,000 in bonds maturing in six years. They had asked for authority to issue $400,000 in bonds to mature in ten years.

To Extend Distribution System

Under approval by the Public Service Commission the Binghamton, N. Y., Gas Works will extend its gas distribution system into Vestal, Broome county, from Endicott and serve about 135 prospective customers under the same rates charged as in Endicott. The company proposes to expend approximately $15,300 to give the service, including laying about 9,000 feet of three and 6,000 feet of six inch mains.

CONVENTION CALENDAR

January

14-15 South Western Division, Natural Gas Department, American Gas Association, Shreveport, La. Henry C. Morris, Natural Gas Department, American Gas Association, 420 Lexington Avenue, New York City, vice-president.

15-16 Southern Regional Sales Conference, Atlanta, Ga. John West, American Gas Association, 420 Lexington Avenue, New York City, secretary.

25 Third Mid-West Regional Sales Conference, sponsored by the Mid-West Regional Sales Council and the American Gas Association, Commercial Section, Chicago, Ill. John West, American Gas Association, 420 Lexington Avenue, New York City, secretary.

February

6-7 New England Gas Association, Annual Meeting, Boston, Mass. E. A. Taylor, 100 Weybosset Street, Providence, R. I., secretary.

Companies Fail To Agree

What is understoood to be the closing chapter of the deal between the City officials of Colorado Springs and the Interstate Gas Company, owners of the Amarillo-Denver natural gas pipe line, has been written. It informs us that the Interstate stood firm in its decision to buy the Colorado Springs municipally owned gas plant, while the city officials refused to sell the plant, but would buy natural gas at wholesale and as neither side would give in the deal is off.

The artificial gas plant of the Springs is making money and the city is located within a stone's throw of huge coal mines, but was willing to substitute natural gas. By retaining ownership it could, if the occasion required, shift back to artificial gas. And as the taxpayers are pleased with municipal ownership this explains its stand.

Three Additional Commission Engineers Appointed

Employment of three additional engineers in the Indiana public service commission engineering department has been announced by Harvey Harmon, a member of the commission. Mr. Harmon said employment of the men was made necessary by the large merger which is pending and other mass of business before the commission. The three new appointees however, will not work on the merger, Mr. Harmon said. They will conduct the routine work of the commission while the regular force of the engineering department conduct audits of properties involved in the large light, gas and traction merger.

Work On St. Joseph Line Progressing Very Rapidly

Work on the pipeline being built by the Cities Service Gas Company from Fort Leavenworth, Kansas, to St. Joseph, Missouri, at the present time is progressing very rapidly. All but about three miles of the line is welded and a considerable amount of ditch has already been dug on both ends of the line. One gang of workmen started from the Leavenworth end and another gang from the St. Joseph end of the line.

It has been estimated that the line will be finished by January 1, and if good weather continues it will be possible no doubt to finish it a week or so before this date.

At the present time the work of laying the line over the Missouri River bridge at Ft. Leavenworth is under way and the last of the week workmen had approximately one-fourth of this work done. The line is being placed on hangers on the south side of the bridge and is being painted as it is being put in place.

Natural Gas In Kansas

The Cities Service Gas Company has natural gas piped from the gas field of the Texas panhandle to Kansas City going via Wichita, serving all communities en route. Now a sixteen inch pipe line has been completed from Kansas City to Ottawa, Kansas to the west and frequent reports are brought in of the uncovering of some huge gas wells in the different oil fields of Kansas, hence it is that it won't be long until practically most of the state will be supplied with natural gas.

Gas Industry is Forging Ahead Says Insull as World's Largest Holder Is Inaugurated

THE gas industry has come into a second youth. We are pushing rapidly ahead," declared Samuel Insull, president of The Peoples Gas, Light and Coke Company, at a luncheon attended by leaders of the utilities industries following formal inauguration of the world's largest gas holder in Chicago, December 19th.

President Insull placing pumping station in service

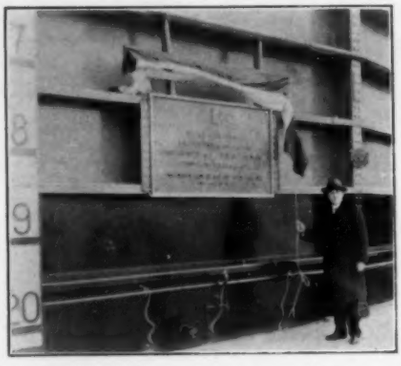
Mr. Insull was enthusiastic about the present and expected growth of the gas industry which necessitated the erection of this 20,000,000 cubic foot holder and said plans are already under way for another of the same size to be built in Chicago by 1930.

Guests, representing chiefly the electric light and power and the gas industries, aviation interests and the engineering profession, participated in the inauguration ceremonies of this mammoth holder which is also the first to be marked and lighted according to official aeronautics specifications for the benefit of air traffic. A bronze tablet, dedicating the holder to the service of the city, was unveiled.

In speaking of the importance of the holder to gas consumers, Mr. Insull said that the total storage capacity of the Peoples system is now 108,000,000 cubic feet which approximates the average daily consumption by the whole city. He pointed to the economic value of ample storage capacity in making it unnecessary to provide production facilities to meet peak demands. Further economies were described in the operation of this new waterless type of holder of large size compared with smaller holders.

"Ample capacity in gas holders lessens the investment necessary to provide for peak demand," he said. "On last Thanksgiving Day, the Peoples Gas Company had to deliver in one hour, from noon to one o'clock, 15,108,000 cubic feet of gas. The average supply for this hour, exclusive of holder storage, was only 8,000,000 cubic feet. The other 7,108,000 cubic feet had to be drawn from the reserve supply in the gas holders.

"Without those gas holders, we would have had to have a production capacity and equipment sufficient to make gas for that extra demand, above the average, of 7,108,000 cubic feet, and that equipment would have required an investment of about $34,000,000. The holder capacity at that time represented an investment of about $9,000,000; therefore, that holder investment of $9,000,000 saved us the necessity of providing a production capacity investment of $34,000,000, or a net saving of $25,000,000 of investment with corresponding saving in fixed charges on the investment."



Vice-pres. Rudd unveiling the Tablet which reads,—"To a better service for the people of Chicago this largest gas holder in the world is dedicated December 19, 1928. The Peoples Gas, Light and Coke Company, Chicago, Illinois.

Since Mr. Insull took over the management of the Peoples Company in 1919, storage capacity has been practically doubled, he said.

Comparing the position of the gas industry with that of the electrical industry with which he has been longer identified, he said: "The energy that can be stored in a 20,000,000 cubic foot gas holder on a Btu basis, is about equivalent to 3,106,680 kilowatt hours of electricity. It would require an electric plant of approximately 130,000 kilowatts capacity, operating twenty-four hours a day, to produce that amount of electricity, comparable in its heat value with the storage capacity of the holder we have just erected.

Attractive cover of program

"It is encouraging to find an industry. as old as the gas industry is, in the condition that it is in both the United States and Europe. We have come, so to speak, into a second youth, and we are, through our sales departments, pushing rapidly ahead, so that it looks to me as if the other public service in which I am very largely interested, electric light and power, must look to its laurels to keep ahead of the gas business.

"There is a new enthusiasm in the gas business in the last ten years. True, it is drawing for its experience very largely on the electric business so far as rate structure and sales policy are concerned. But although we started a little behind the electric business, I think we are showing a very good account of our efforts at this time, and I personally have just as much confidence in the development of the gas industry as I have in the development of the electric industry."

William G. Rudd, vice-president of The Peoples Gas, Light and Coke Company, in charge of operations, officiated at the holder ceremonies, unveiling the dedicatory tablet. Samuel Insull threw the switch placing the engines in operation which have a capacity for pumping gas into the city's mains at the rate of 36,000,000 cubic feet per day.

"When some of us could think of a new holder only in the terms of known size," said Mr. Rudd, "Mr. Samuel Insull, whose experience with utilities and Chicago's rapid growth, had the vision to insist on a larger unit than we had been using in the past. This not only insures the supply of gas to our customers,

17,611,911 ***represents the combined circulation of a single issue of the 12 great publications that will deliver Red Wheel Gas Range advertisements to women during 1929. With few exceptions these ads are all full-pages printed in colors. These advertisements reach every gas-metered home in the United States, not once but many times during the year.***

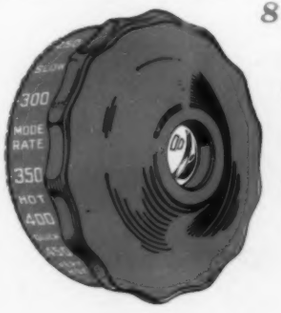
1929 marks the Tenth Anniversary of the beginning of American Stove Company's national advertising campaign on the Lorain [Red Wheel] Oven Heat Regulator . . . the largest, most persistent, most effective advertising effort ever known in the history of gas and gas appliances.

Within and without the industry those who are in a position to judge state that the "Campaign of the Red Wheel" has given to the gas industry the finest and most continuous publicity it has ever received.

In addition, Red Wheel Advertising has raised the quality-standards of gas ranges; enabled retailers to sell on a more profitable basis; and, by creating among consumers a demand for modern, efficient gas appliances, has brought increased happiness to millions of homes. ◆ ◆ ◆ ◆ ◆

AMERICAN STOVE COMPANY

801 Chouteau Avenue . . . . St. Louis, Mo.



LARGEST MAKERS OF GAS RANGES IN THE WORLD

LORAIN RED WHEEL

These are the Six Famous Brands of Red Wheel Gas Ranges:

DANGLER · CLARK JEWEL · QUICK MEAL
DIRECT ACTION · NEW PROCESS · RELIABLE

IN the twelve months to come, there are a few more than three hundred selling days. To the gas industry it is a year of promise during which the automatic water heater will reach a full stature of development and selling strength it so rightfully deserves.

The pains and illnesses that always beset the discovery or re-discovery of an El Dorado are happily, for the most part, in the past. Like the ancient alchemists and their dreams of synthetic gold, gas executives know that low prices are no surety of volume sales, no substitute for mechanical quality or intelligent sales guidance and sales help.

The lasting popularity of the automatic gas water heater depends now, as always, on a fundamental and unchanging policy of public education in the importance of continuous and abundant hot water and the need of a reliable machine that will keep faith with the promises made for it.

The GAS platform for 1929 is, then, quite plain. The RUUD program for 1929 is in harmonious agreement with these essentials and their fulfillment will be our sole objective.

New methods, new plans, new models and new engineering are the tools, all to be made known to you within the coming weeks.

Ruud Manufact

PITTSBURGH—

TORONTO HAMBURG

The Mass Market and RUUD-AUTOHOT

THE great selling successes have been based on mass appeal. Given an article that performs a necessary service . . . *better* . . . and you have the key to the mass market. Add an article of recognized merit and the door is open. Such a market is the small home, awakened as never before to the need of continuous hot water service. Such an article is the RUUD-AUTOHOT Automatic Storage Water Heater, now adding the fast selling factors of beauty of color, line and proportion at no advance in cost. Details soon.

The Market for Continuous Flow Models

THE work that automatic water heaters must do is as complex as life itself. Human conduct, habits and living standards . . . the changing ideas of architects and builders . . . the manufacturing methods of gas companies . . . even the caprices of nature in its supply of water . . . are but rarely twice alike. There is but one constant factor in the science of water heating—that the owner *have* hot water when he *wants* hot water. For these reasons, automatic water heaters are made in different types, of which the continuous flow model is one. Gas executives knowing that its proper application is of prime importance, are glad that RUUD will present a new and improved model of definite mechanical superiority.

The Specialized Market for the RUUD No. 95

NO general sales formula will suffice for the small home or mass market. Where climatic conditions have raised the temperature of supply water, as in the south, southwest and far west, the RUUD No. 95, (a continuous flow model) is assured a high place in gas sales plans. In communities where water supply is high in content of iron-attacking and acid-forming minerals, and breakdown of galvanized tanks is consequently rapid, the RUUD No. 95 meets the specialized conditions as no other type can. Important announcements, soon ready.

The Specialized Market for Volume Water Heating

LONG neglected, this sleeping giant awakes as gas executives come to full realization of its influence on gas production. Old-fashioned methods of volume water heating form a focal point of sales attack in 1929. Mass market methods will not win; this special market needs a special organization of merchandising forces. In their formation and re-formation, RUUD is ready . . . with new ideas . . . with new sales plans . . . and a series of new and brilliant engineering improvements, all in your hands before long.

uring Company

—PENNSYLVANIA

LONDON

but also has the effect of reducing the investment charges per unit of storage capacity.

"These are the reasons for dedicating today the largest gas holder in the world which is directly connected to the longest forty-eight inch gas main in the world.

"The holder in plan is a twenty-eight sided polygon, built up of 141 courses of steel plates, with six balconies around the outside, approximately sixty feet apart. It is 283 feet in diameter and 416 feet high to the top of the crown. It is 490 feet high to the top of the beacon staff.

"There were used in its construction 5,500 tons of steel and approximately 2,000,000 rivets. The foundation consists of a 12-inch concrete pad spread on approximately 500 reinforced concrete piles, each 17 feet deep. One hundred thousand gallons of tar are required for sealing the piston. The piston weighs 630 tons and there are uniformly spread over it 395 tons of concrete blocks and even with this great weight, on account of its large area, it throws only ten inches water column pressure which is equal to about one-third of a pound."

At a luncheon immediately following the ceremony, besides Samuel Insull, speakers included: Alexander Forward, representing the American Gas Association; Howell Fisher, president of the Bartlett Hayward Company, builders of the holder, who did the work in record time; George B. Foster, Chairman of the Aviation Committee of the Chicago Association of Commerce; and a representative of the Mayor of Chicago. Bernard J. Mullaney, vice-president of The Peoples Gas, Light and Coke Company, in charge of public and industrial relations, was toastmaster.

The holder has already attracted nation-wide interest and many messages of commendation and congratulation have come to the Peoples Company from representatives of the gas industry and especially from commercial aviation interests and from the Aviation Divison of the United States Department of Commerce, which says, "The marking and lighting of this structure for the benefit of aviation is a very valuable contribution to aeronautics."

Society of Gas Lighting Elects Officers

The 52nd Annual Meeting of the Society of Gas Lighting was held at the Hotel Astor Thursday December 13th and the following officers elected:

President Wm. Cullen Morris, Vice-President Alfred E. Forstall, Treasurer Wm. J. Welsh, Secretary George G. Ramsdell; Member of Executive Committee J. Arnold Norcross, Finance Committee; Oliver H. Smith, Chairman, George S. Hawley, Alexander Forward.

Modernization of Union Gas Company of Bloomington, Illinois

Rehabilitation of the plant of the Union Gas Company of Bloomington, Illinois, which has been carried on steadily since 1921 when R. E. Chew became general manager, necessitated an expenditure of $250,000, exclusive of replacements. These improvements include a new boiler plant, two new turbines, the rebuilding of the water gas set and the installation of automatic controls, a relief holder of 150,000 cubic feet capacity, coal handling equipment and additional purifying capacity. The plant, at present is modern in every way.

The Bloomington company manufactures and distributes at the present time, approximately 1,000,000 cubic feet of gas per day, using approximately 1,000,000 gallons of oil per annum and also 10,000 tons of coal and coke. Normally, about 60 persons are employed, but for a period of seven months between Spring and Fall, this number is increased to 100 to 120 to take care of expansions and betterments of various kinds.

Of late years, the company has engaged actively in the house heating and industrial field. There are some very complete industrial installations in various factories about the city and suburbs, while there are 20 residences that are heated with gas. The major industrial operations include coffee roasting by wholesale grocers; a drying oven of 120 feet length, at the Meadows Manufacturing plant; enameling and japanning ovens at the foundry plant of the Hayes-Custer company; while the Tyree Radiator company utilizes a large number of burners and vat connections. The Union Gas company but recently closed a contract with the Chicago & Alton railroad to replace 18 to 20 furnaces of crude oil connections, with gas.

Petition to Transfer Franchise

The Oliver Gas & Fuel Company, serving natural gas in part of Tonawanda township, Erie county, has made application to the Public Service Commission for consent to transfer its franchise and property to the Republic Light, Heat & Power Company which serves Kenmore, Tonawanda and a part of Tonawanda township. The latter company joins in the petition asking authority to acquire the stock of the Oliver company.

The petition states that the principal owner and operator of the Oliver Company died about a year ago and that his beneficiary, a sister, is not able to continue to operate the company. It is further stated that the Oliver Company is not in a position to extend its service, while the Republic Company, if the petition is granted, can make extensions desired by residents of the town and give better service than the Oliver Company is now able to do.

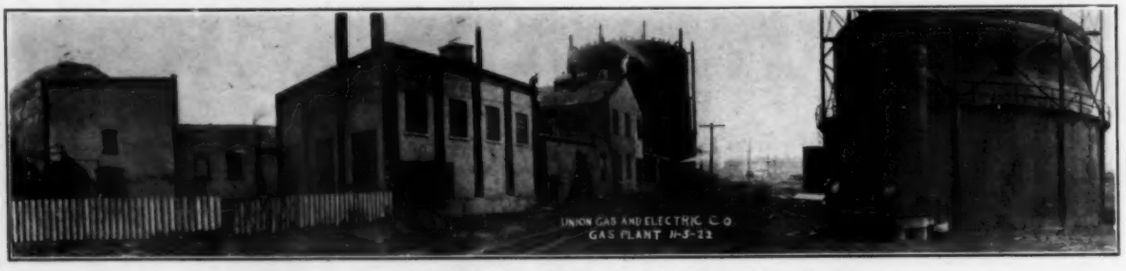
New Gas Rates For Atlanta

New gas rates for Atlanta and its suburbs were recently set by the Georgia public service commission following three hearings at which representatives of the Georgia Power Company and the different cities involved in the case were heard.

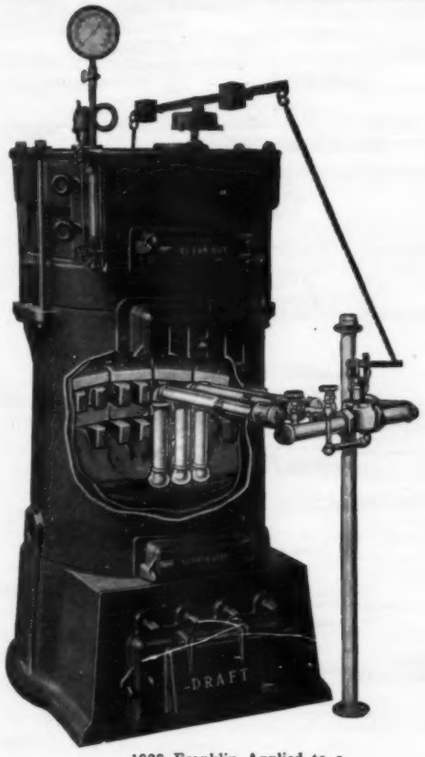
First, the commission fixed the valuation of the gas properties of the company, for rate-making purposes, at $9,320,524.34. Of this amount, the value of the property in 1924 was taken at $6,969,000; additions and improvements between 1924 and 1927 were listed at $1,186,022.13; ten per cent for going value, coming to $805,502.21 was allowed, and $350,000 working capital was taken.

The commission stated that the company should be allowed to make up the losses it had incurred during past years, and fixed a schedule which, while lowering the rates in the suburban cities and equalizing the rates throughout the district, yet would yield approximately the same income to the power company.

The present rate on gas in Atlanta, which is $1.55 per thousand cubic feet, was reduced to $1.40 per thousand cubic feet for the first thousand feet, with a charge of $1.10 per thousand for all gas



Partial view of the modernized gas plant at Bloomington



1928 Franklin Applied to a House Heating Boiler

Make This Year Prosperous!

We wish you not only a prosperous New Year, but also place within your reach the means for realizing our wish.

During the year at hand you can speed up the installation of gas-fired house heating equipment, and heating plants of larger capacity, with the aid of

The New 1928 Improved FRANKLIN Gas Burner

No need for expensive pipe layout, boiler or furnace, no extensive alterations. An easily and quickly installed gas burner, which can be used on any existing coal-fired boiler or hot air-furnace system. It is positively the last word in the practical and efficient combustion of the gases, in which air and gas are mixed to the highest degree of perfection.

Automatic regulation of air assures intense blue flame under all conditions. Burns natural or artificial gas or their combination. Flame will not extinguish on low pressure. No backfiring in the mixer. Approved by the fire insurance companies: Over 200,000 Franklin Burners of all types are now in use in many parts of the country, which prove their merit.

1928 Franklin High Power Gas Burner System

Feature the *New* 1928
FRANKLIN GAS BURNER
and enjoy A Prosperous New Year

Patented and Manufactured Exclusively by

THE FRANKLIN GAS APPLIANCE COMPANY

Cincinnati, Ohio.

used above this amount. The rate in College Park, Hapeville, East Point and Decatur—all suburbs of Atlanta—was reduced from $1.65 per thousand cubic feet to the same schedule, thus equalizing rates for the entire section.

However, to offset the reduction in rates, the commission allowed a customer's or service charge of $1.00 per month on all meters.

This is the first time the commission has adopted the principle of the service charge for public utilities in the state, and it will allow the gas company to overcome the losses sustained now through small uses of gas.

The commission also ordered the removal of all gas pay meters in the city upon the adoption of the service charge, holding that they could not be operated under the new schedule without discrimination.

Natural Gas in California

Compilation of reports from the various oil and gas fields of California, for late November credit the state's daily output of natural gas at one billion cubic feet. There are many plans under way to take care of this gas and use it to the best advantage.

Natural Gas in Great Demand

In Pueblo Colorado there has been added more than five hundred new gas customers since natural gas supplanted artificial gas, the load for one week in November this year being 9,010,000 cubic feet while during the corresponding period of 1927 the load with artificial gas was only 1,320,000 cubic feet.

Lake Shore Gas Company Shows Attractive Floats

More than 20,000 people attended the exercises at Ashtabula in connection with the recent opening of the new viaduct over the Ashtabula River on the U. S. Route No. 20, the Chicago-Buffalo highway. A part of the celebration was a parade over two miles long illustrating progress in living conditions in the last century.

The floats of the Lake Shore Gas Company received the most favorable comment of any in the line.

The Lake Shore Gas Company's exhibit consisted of two trucks showing housekeeping with and without the advantages of modern fuel. On the first truck "mother" was heating water over the kitchen fire and giving little Willie his bath in a wash tub on the kitchen floor. On the second truck was a modern bath room, in which a likely looking youngster was enjoying all the comforts of a modern home.

New Gas Company Begins Operation

On December 1st, 1928 the first gas was sent out from a plant constructed during the past summer by the Central Pennsylvania Gas Company. The territory, right in the heart of Pennsylvania, is a new field. Bellefonte and State College are being supplied now from a carburetted water gas plant located between

both places over a high pressure transmission line of 14 miles. Sixteen miles of distribution lines have been laid and 673 services run since June, when the first ditch was opened. The Central Pennsylvania Gas Company was formed for the purpose of building this property after the design of F. L. Murphy, who also took charge of the construction and is now its General Manager. An account of the history of this enterprise was given in the July issue of the Journal.

Indianapolis Retains Newton D. Baker

Retention of Newton D. Baker of Cleveland, O., former secretary of war, to represent Indianapolis in enforcing the contract with the Citizens Gas Company has virtually been decided on, it has been learned. Mayor L. Ert Slack and John W. Holtzman, the city corporation counsel, declined to comment on steps being considered by the city.

While it was learned that Charles Evans Hughes, former secretary of state, and John W. Davis, Democratic candidate for President in 1920 also have been considered, the mayor refused to confirm these reports.

"I am not ready to make a statement," the mayor said. "We want to study the opinion given by attorneys for the gas company recently and determine fully our course before we make a definite move."

The fact that Mayor Slack asked that a $50,000 mayor's emergency fund be kept in the 1929 city budget was regarded as an indication that he contemplated several months ago the employment of at least one outstanding attorney to represent the city.

To Improve Natural Gas Supply

Steps will be undertaken to better the natural gas supply in the territory of the Newfield, N. Y., Gas & Oil Company in Livingston county under a recent order of the Public Service Commission approving the lease of the property and gas well leases from the Newfield company to Frank J. Stoltz, an official of the New York Central Electric Corporation. The Commission also approved operation of the gas plant by Mr. Stoltz in Sansville and West Sparta, Livingston county, under franchises granted by the town boards.

According to the evidence submitted at a hearing before Commissioner Brewster the company has not been operating at a profit, has not been able to keep up its property and recondition its wells and as a result the quantity of natural gas has diminished. Mr. Stoltz intends to at once take steps to increase the supply by installing modern pumping equipment and secure a more stable supply of gas. He will continue to deliver the gas to the New York Central Electric Corporation for supply in Evansville and also supply customers of the Newfield Company along the line.

Two of the floats of the Lake Shore Gas Company

THE KOMPAK CO.

Automatic Thermostatic Gas Water Heaters

NEW BRUNSWICK
NEW JERSEY

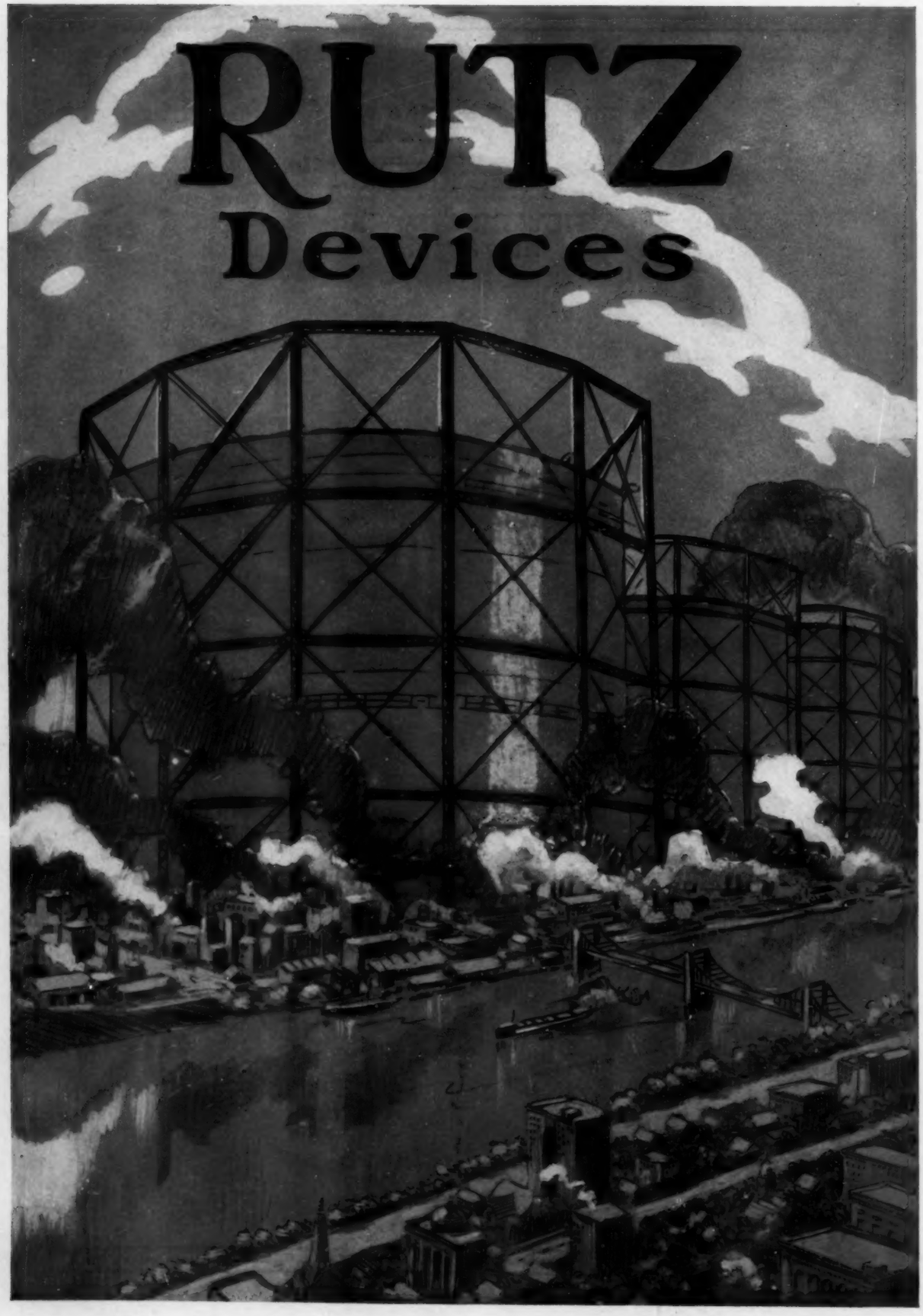
KOMPAK COPPER WATER HEATERS

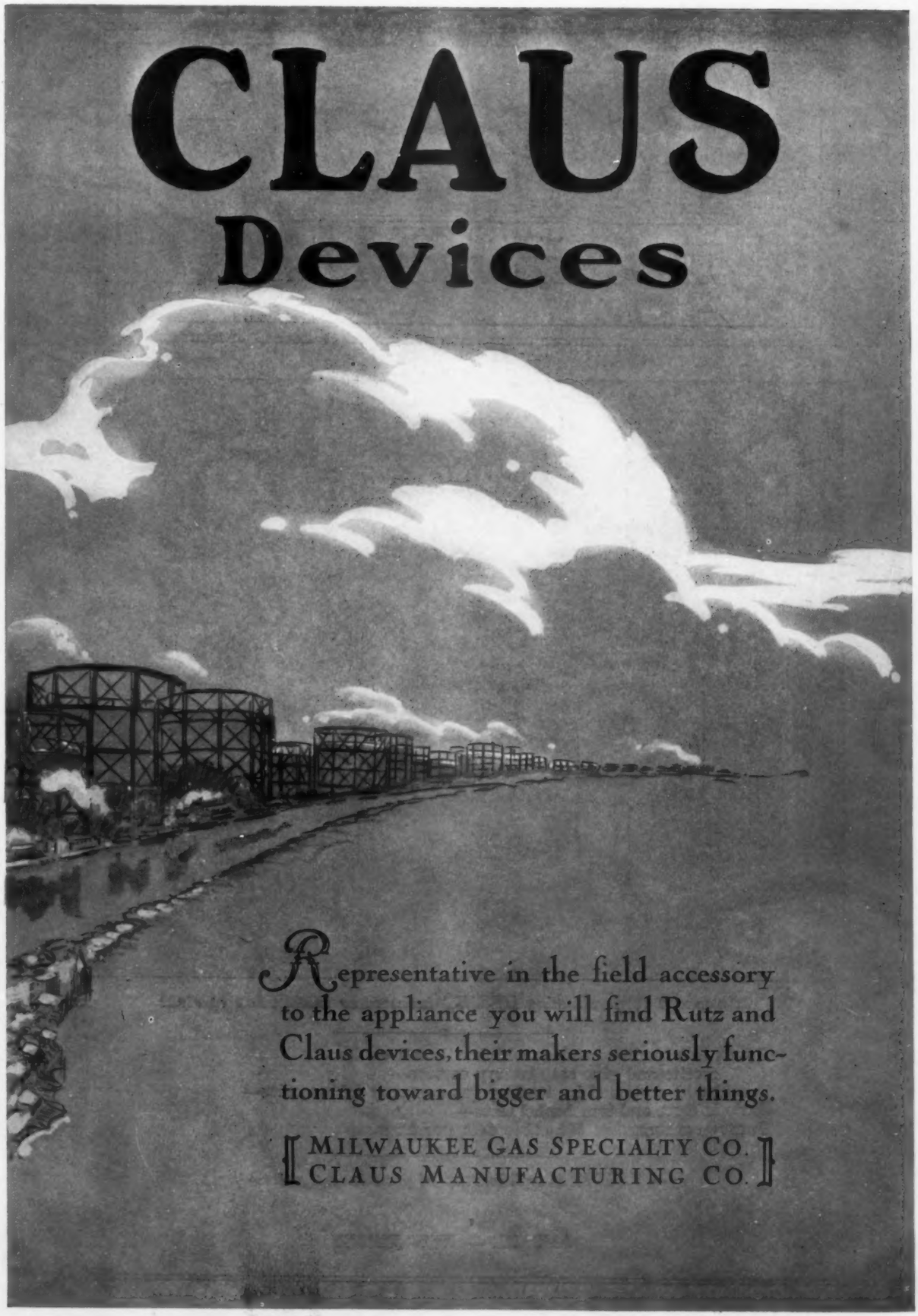
FOR

1929

Each year shows a steady growth in the sale of Kompak Copper Storage Systems.

Each year those gas companies who offer the Kompak for sale, are finding an increasing number of people who are willing to pay the slight extra price for the superior quality—and exclusive features found only in the Copper Kompak.

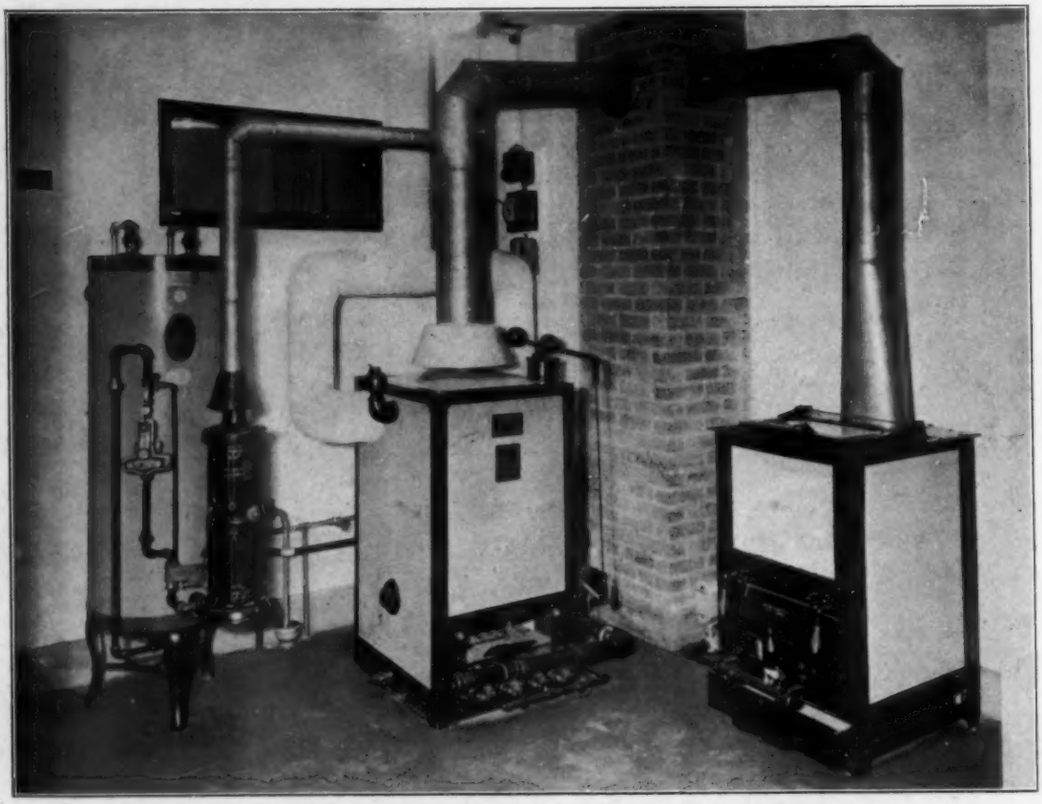

RUTZ
Devices


CLAUS
Devices
Representative in the field accessory to the appliance you will find Rutz and Claus devices, their makers seriously functioning toward bigger and better things.
MILWAUKEE GAS SPECIALTY CO.
CLAUS MANUFACTURING CO.

Kernit

REG. U. S. PAT. OFF.

GAS-FIRED INCINERATOR



Basement scene showing KERNIT incinerator installation at right

Kernit is a quality product which will sell on its merits and give satisfactory service—
Tested and approved by leading gas company laboratories—
Made in three and four bushel sizes—
Burner consumption 100 cubic feet per hour.

—KERNIT is well worthy of your investigation—

KERNIT INCINERATOR COMPANY

AMPERE — NEW JERSEY

Commissioner Brewster, in recommending approval of the lease of the Newfield Company's property, holds that this action is in the public interest.

Plans Completed for Supplying Natural Gas

A contract has been closed for delivery of natural gas from fields east of Princeton, Ind., by the Hope Engineering Company to the Princeton Utilities Company. Fifteen million cubic feet a day are now available and more wells will be put down. Gas will be taken to Princeton in a four-inch main. A six-inch main will carry gas to Vincennes and Washington, Ind., for use there.

Closing of the contract follows a series of engineering tests in the last eight months which determined that the gas entirely was free from sulphur. The Princeton Utilities Company expects to deliver to customers by next May 10. The city at present is using artificial gas.

Commission Directs Hearing Concerning Rate Schedules

The Public Service Commission recently directed a hearing before it at 100 State St., Albany, on January 15 at 10.30 A. M. as to existing schedules of rates and charges for gas and electricity of all gas, electrical, and gas and electrical corporations serving the public "to the end that the Commission shall, if it deems proper, by order prescribe uniform forms of schedules and regulations for all such rates and charges throughout the State of New York."

This action was taken by the Commission, based on a memorandum by Chairman Prendergast, approved by the Commission, which recommended that the Commission should of its own motion enter upon an investigation in respect to a type of uniform rate applicable to the gas and electric industries. It was also stated that during the past few years there has been some general discussion on the subject and at the present time a committee representing the electric industry is considering such a proposition for that industry.

The order of the Commission will be served on all corporations supplying gas and electricity to the public.

More Natural Gas

The El Paso Natural Gas Company has been organized, capitalized at eight and one half million dollars for the purpose of piping natural gas from the Lea county, New Mexico, field to El Paso, Texas, through a sixteen inch pipe, two hundred miles. While it is not definitely stated, still it is generally believed that the Marland Oil Company and the Texas Company are backing the venture. There is an abundance of natural gas in Lea county as it is just over the line from the big oil fields of west Texas.

Personals

Blackwell Newhall was recently elected assistant secretary of The United Gas Improvement Company, filling a vacancy created several months ago when Johns Hopkins was advanced to the post of secretary of the company.

Blackwell Newhall

Mr. Newhall had been special assistant to the vice president in charge of finance. He became associated with The U. G. I. Company in January, 1927, and previously had been assistant power engineer of The Philadelphia Electric Company. Mr. Newhall is a graduate of the United States Naval Academy and Pennsylvania State College. Following his graduation from the Naval Academy he served as an ensign on the battleship West Virginia. His home is at Ithan, Pa.

Fred B. Blackburn, Aurora, district manager of the Albert Wahle company, New York City, has been appointed field manager of the Rockford, Ill. Gas-Electric-Traction company, it was recently announced by D. L. Cash, commercial manager of the corporation. Mr. Blackburn has had 18 years' experience in the field.

Fred I. King, who has been associated with the Indiana state fire marshal's office for the last three years, has been named secretary of the Indiana public service commission, succeeding J. Reid McCain of Delphi. Mr. King was an active supporter of the incoming governor. Mr. King is an attorney and for some time was legal adviser for the Indiana Federal prohibition bureau.

Major T. J. Strickler, Vice-President and General Manager of the Kansas City Gas Company, made such a success as director of the Allied Charities Campaign in Kansas City, that he has been chosen to organize and direct it again in 1929. Never before has any Kansas City man been given this honor as Major Strickler will be the first general chairman of the campaign to direct more than one charities drive. It was through the influence of some of the leading business men and civic leaders that Major Strickler accepted this very important task for 1929.

H. H. Harrington, who for a short time has been manager of the Union Public Service Company at Parsons, has been promoted to General Superintendent of the St. Joseph Missouri Gas Company.

Ralph Weir, formerly New Business Manager at Ottawa and who has been New Business Manager of the Parsons Gas Company for the past year and a half, will succeed Mr. Harrington as manager of the Parsons company.

Ed. S. Larson, who formerly was engineer of the Parsons Gas Company, has been sent back to Parsons as Superintendent at this property under Mr. Weir. Mr. Larson was transferred from Parsons to Arkansas City as Superintendent of the Arkansas Valley Gas Company on May 1st. This was at the same time Mr. Harrington was transferred from Arkansas City to be manager of the Union Public Service Company at Parsons, Mr. Harrington replacing Ed. S. Pfenning who was transferred to Joplin as Manager of the Joplin Gas Company.

W. A. Jones first vice president of the Cities Service Company has been elected a vice president and director of the Public Service Company of Colorado. Mr. Jones is understood to be an authority on petroleum questions and natural gas, hence it is that within the near future it would not be surprising to learn that some of the enormous natural gas supply which the company controls will be utilized in absorption plants, much gasoline, and other byproducts marketed and the dry gas serving industrial plants.

R. L. Grissom, manager of the Natchez properties of the Southwestern Gas and Electric Co., will head the Natchez Association of Commerce as president of that organization for 1929, his nomination having been accepted in a report of a nominating committee presented at the directors meeting of the Association Tuesday evening. H. S. McElroy, president of the McElroy Motor Co., will be vice-president of the commercial body.

George W. Schwaner, Springfield, Ill. will become new secretary of the Illinois Gas association, representing state utilities affiliated with the organization. He also serves as secretary for the Illinois Electric and the Illinois Street Railways association. Mr. Schwaner will succeed the late R. V. Prather, for whom resolutions of respect were adopted by a special committee of which A. D. Machie, general manager for the Illinois Power company in Springfield, was chairman. The state groups, including the gas association, will hold their annual session in Springfield, March 13 and 14, and are preparing for reception of 2,000 delegates.

Thomas Crawford, general manager of the Clinton, Iowa, plants of the Interstate Power Co., since Sept. 1, 1905, has resigned effective January 1 and will be succeeded there by G. B. Miller of Oelwein. As Interstate manager in Clinton he has had charge of both the gas and electric services of the company. When the Interstate took over the Clinton Gas & Electric in April, 1926, Mr. Crawford, who was then general manager, remained with the new owners.

Burt Hamerstrom, of H. M. Byllesby is now in charge of the transportation department of the Market Street Railway Company, San Francisco, California. His title has been changed from vice-president in charge of the commercial department to vice president in charge of service. Mr. Hamerstrom has been appointed to succeed the late M. McCants.

C. L. Owen, assistant manager, northern division, Oklahoma Gas and Electric Company, has been appointed acting manager of the division, to assume the duties of manager until a permanent appointment is made. The position was made vacant by the death of Lincoln Beerbower. Headquarters of the northern division are at Enid.

Obituary

Geo. S. Burtner

George S. Burtner, aged 72 years, for 46 years associated with the Muscatine Lighting company, subsidiary of the United Light & Power company, and in recent years foreman of the gas department, died Dec. 5 in his home, after a brief illness. He was reputed to be one of the oldest utility employees in the state in years of consecutive service. His widow, a son and a daughter survive.

Edwin C. Falvey

Word has just been received of the death of Mr. Edwin C. Falvey, Sales Manager of The Sprague Meter Co., which occurred January 5th at Greenville, Ohio, following an automobile accident.

Mr. Falvey has been with the Sprague Meter Company, in charge of branches and western sales for the past eighteen years. On January 1st he was made Sales Manager, and was preparing to locate in Bridgeport March 1st.

He was thirty-eight years old, a Mason, and affiliated with the American Gas Association, Natural Gas Association, Midwest Gas Association, Michigan, Indiana and Illinois Gas Associations, and leaves many friends in the gas fraternity who will mourn his loss.

Mr. Falvey is survived by his wife, Florence, of No. 1507 College Ave., Indianapolis, Indiana, and by his mother who resides in Los Angeles, Calif.

Trade News and Construction

Work Progressing On New Addition To Groble Plant

Steel needed for the framework of the new addition to the plant of the Groble Gas Regulator plant at Anderson, Ind., is being put in place. According to an announcement at the plant, it will take about three weeks to frame the building and cover it with hollow tile. It will be used for assembly purposes and a machine shop about the first of the year, or at least by the middle of January. The addition is 40 by 100 feet and is directly west of the present buildings. It will match them in style and color.

Semet-Solvay Engineering Corp. to Install Steere Cooling Coils at Atlantic City—Other Contracts Received

The Atlantic City Gas Company has ordered six stacks of Steere standard cooling coils. They will be 32 tubes high, the tubes made of 13 gauge seamless steel. Troughs and leveling screws will be provided for each stack and the tubes will be sherardized to resist corrosion.

The Illinois Power & Light Corporation of Jacksonville, Ill., has placed an order for purifier trays. The order specifies the newest type of patented tray which is made entirely of wood, requiring no metal bolts.

A new Steere water gas machine is being put into service by the Rochelle, Ill., Gas Company. It is a 5 ft. size and is equipped with a Backrun. The new equipment includes a Doherty washer cooler 30 ft. high x 30 in. diameter and contains 25 vertical feet of grids. A quantity of new plant piping was also installed in the plant.

A Steere welded steel purifier is being furnished for the Central Maine Power company at its plant in Rockland, Me. The purifier is 9'6" x 30' x 10'6" in size. It will be completely built and tested in the Semet-Solvay shops and delivered ready for mounting on its foundations. A 10" manifold and necessary valves are included in the installation.

The Penn Central Light and Power Company has purchased a 400 gallon capacity R S De-Emulsifier for its Lewiston plant. This apparatus will be used to remove the water content from tar emulsion, leaving a tar that meets commercial requirements.

The municipality of Sherbrooke, Quebec, has purchased for its gas utility a 400 gallon capacity R S De-Emulsifier for the dehydration of water gas tar emulsion.

The Gas Division of the Quebec Power Company has ordered a quantity of Steere welded steel pipe, fittings and valves for a booster installation. The pipe varies in diameters from 10" to 20". It will be tested for tightness at 25 pounds per square inch of air pressure.

The North Adams, Mass., Gas Light Company has purchased a 1,400 gallon capacity R S De-Emulsifier for the dehydration of water gas tar emulsion. This is the second installation which the engineers in charge of this utility system have purchased.

The Semet-Solvay Engineering Corporation of New York is remodeling the water gas plant of the Penn Central Light and Power Company in Huntington. A water gas machine is being rebuilt and fitted with a Backrun. A large amount of new piping for gas, steam, oil and water is being installed. The water gas machine will be equipped for hydraulic operation.

There is being built a water gas plant at Exeter, N. H., for the Colonial Utilities corporation. The new equipment includes a Steere water gas machine, a Doherty Washer Cooler with cooling coils, a Steere Multiple Washer and a welded steel purifier, 10' x 20' x 10' in size and the necessary plant piping. The work is progressing rapidly in order to have the new equipment in service at the earliest possible date.

The Alabama Power Company has installed a Backrun on a 5' water gas machine located in its plant in Montgomery.

There has just been completed installation of a quantity of Steere welded steel pipe and fittings on the plant of the Wilmington, Del., Gas company

Servel Sales, Inc., News Items

Mr. W. G. Wright has been appointed district manager covering the eastern part of Missouri and the southwestern portion of Illinois.

Mr. Wright has been in the refrigeration business for some years and most recently with the Copeland company.

Mr. G. A. Knowles who has been associated with Servel Sales, Inc., for the past three years, has resigned to become associated with the Standard Underground Cable Company with headquarters at Pittsburgh, Pa.

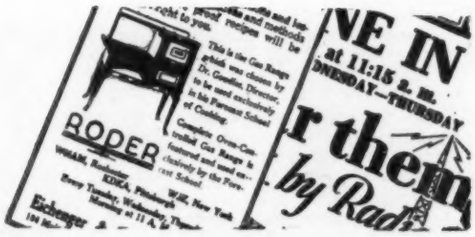
Mr. Knowles has been in charge of Servel operations in the Philadelphia territory.

Announcement has been made by Mr. H. W. Foulds, Vice President-Distribution, of Servel Sales, Inc., of the division of the advertising and sales promotion activities.

Advertising activities will be under direct charge of Mr. William H. Reynolds, advertising manager with headquarters at 51 E. 42nd Street, New York City, while sales promotion activities will be directed by Mr. A. T. Golding with headquarters at Evansville.

The announcement has been made of the appointment of the Atlantic Utilities Company, Bridgeport, Conn., as distributor for Servel and Electrolux refrigerators.

ROPER



RADIO BROADCASTING

". . . the biggest gas range merchandising success in years!" Say Roper Merchants

Greater than all expectations are the results being accomplished through Roper's nation-wide radio broadcasting campaign.

Letters, by the thousands, are pouring in—asking for further information about Roper Gas Ranges—requesting the names of merchants handling these ranges.

Newspaper articles are appearing all over the country — creating additional public interest in the broadcast—lining up new listeners in tremendous numbers.

Roper merchants are turning this broadcast into solid cash in the form of increased gas range sales and increased sales of gas—by running announcements of the Radio Cooking School in their newspaper advertising.

Are you getting—or missing—the sales this broadcast is creating? Now's the time to get going on this proposition. Write or wire us.

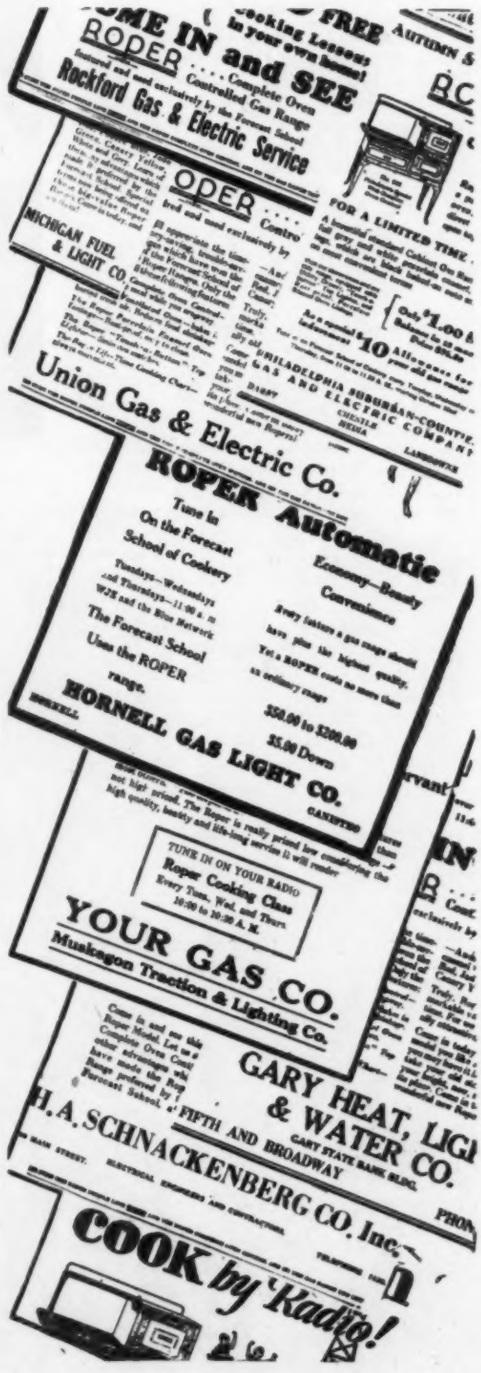
GEO. D. ROPER CORPORATION
ROCKFORD, ILLINOIS

ROPER

GAS RANGES

RADIANT HEATERS—GAS FIRED FURNACES

Roper's great broadcast is being conducted by the famous Forecast Cooking School, New York City, over the nation-wide Blue Network.



BE SURE THE ROPER PURPLE LINE ▬ AND THE ROPER COMPLETE OVEN CONTROL ARE ON THE GAS RANGE YOU SELL

Announcement has been made of the appointment of Floyd Hardware Co., Gallup, New Mexico, as distributors for Servel refrigerators.

The Gas Electric Refrigeration Company at Cleveland, Ohio, has been appointed distributor for Servel and Electrolux products.

Mr. Geo. F. Bursley is President and Mr. C. A. Ringler, Sales Manager.

Forschner Becomes Secretary of Atlas Conveyor Co.

The Atlas Conveyor Company, Incorporated, of 20 South 15th Street, Philadelphia, Pennsylvania, builders of Cable Fower Scrapers, etc., announce that Mr. A. J. Forschner, who joined the Company in July as Vice President, has also taken over the duties of Secretary for the Company. Mr. E. A. Thumlert, formerly employed in this capacity, is no longer connected with the Company.

Ripley to Represent Business Papers

E. F. Ripley, who for several years has represented the Robbins Publishing Co. in the Eastern territory, will open an office at 118 East 28th Street, New York, on January 2nd, as representative of a number of business papers, covering various industries, in the New York territory. Mr. Ripley's many friends in the gas industry will wish him success.

The Brown Instrument Company Moves New York Office

The New York Office of The Brown Instrument Company is now located at Room 1502 Roebling Building, 117 Liberty Street, New York City, removing from 50 Church Street.

This change was made necessary by the need of larger quarters to provide for the increased staff now attached to this district office.

It is believed that this increase in the Brown Instrument Company staff, together with the better facilities afforded by a larger office will be of material benefit to the company's customers in this territory.

International Combustion Personals

J. L. Tildsley, Jr. formerly with the American Cyanamid Company is now identified with the Tar Products Division of International Combustion Tar and Chemical Corporation—200 Madison Avenue, New York, N. Y.

H. D. Savage, President of Combustion Corporation of America, announces the election of Carl F. Weigel as Vice President and General Manager of the subsidiary company, Hedges-Walsh-Weidner Company, Chattanooga, Tenn.

W. D. Collins—Chief Engineer of Servel, Inc.

Announcement is made January 1, 1929, that W. D. Collins who has been Acting Chief Engineer for Servel, Inc., will become Chief Engineer — with complete charge of all engineering of Servel, Inc.

Mr. Collins has been with the Servel organization since January, 1926, coming to them as Assistant Engineer on refrigeration, automobile bodies and gas engine production.

W. D. Collins

He was formerly associated with the Premier Motors, Stutz, Gardner Motor and H. C. S. Motor Car Co., as Assistant Chief Engineer, being direct assistant to H. C. Stutz, having charge of engineering and design and in charge of production.

Piser and Associates Acquire Gas Business of Welsbach Company for New England

A recent notice to the trade by the Welsbach Company of New England over the signature of its President, Sidney Mason, has gone out to the New England Gas Companies advising them that the gas part of the business, comprising such items as Water Heaters, Room Heaters, Mantles, Lamps and supplies, has been acquired by the Welsbach Water Heater Company of New England, under the management of Theo. H. Piser, with his associates, Messrs. S. B. Palmer, Chas. S. Goddard and Edw. A. Colgan, who all have long been active in this division of the business.

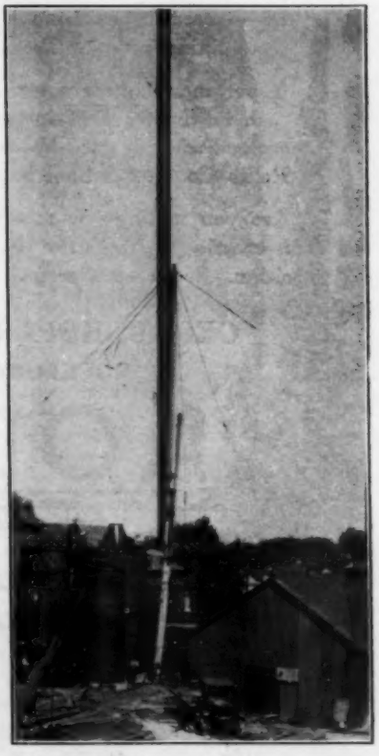
Mr. Mason says, "We bespeak for the new Company the same support you have in the past so very generously accorded to us and unhesitatingly assure you of the new Company's fullest cooperation, care and attention to your future business demands."

The Welsbach Water Heater Company of New England is located, with ample stock and space, at 113 Purchase Street, where they will be glad to welcome their old and new friends.

Troop Appoints Texas Representation

On account of increasing business on their products in the Southern territory, the TROOP WATER HEATER COMPANY is arranging to have a factory representative in Dallas, Texas, from which point TROOP Heaters will be distributed. Mr. William C. Roemhild, a factory-trained man, will be permanently located in Dallas on and after January 1, 1929.

This company is also building a large addition to their present plant; and after the addition is completed, about January 1st, they will be able to increase production on automatic water heaters and heating boilers.



The above photograph shows the use of a motor truck at the gas plant of the Pacific Gas and Electric Company, Sacromento, Cal., in lifting a six ton smoke stack into position, twenty-five feet above the street level.

SUPERIOR

Gas Meters
Provers
Service Cleaners
Diaphragms

SUPERIOR METER CO.

167 - 41st Street
Brooklyn, N. Y.

THE SMART MANAGER WILL DO THIS:—

Before he decides the elevator matter WRITE OR GO SEE MILLS USING RIDGWAY ELEVATORS.

Here's one near New York—One of the Biggest in the land:—Manhattan Rubber Mfg. Co., Passaic, N. J.

In 1925 this great company put in 2 Ridgway Elevators of large capacity.

After using these 3 years they have just installed more Ridgway Elevators.

Our man who erected the last installation has just returned home and says:

"THEY ARE SIMPLY TICKLED PINK WITH THEIR OUTFIT OF RIDGWAY ELEVATORS AND ARE TALKING OF CHANGING ALL THE OLD ELEVATORS OVER."

So, Mr. Mill Manager, do not decide upon any proposed elevator before writing the Manhattan folks and find out why they are "Tickled Pink" just because they have

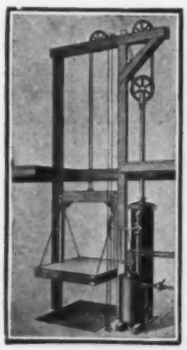
"HOOKED 'ER TO THE BILER"

United Gas Imp. Co.	H. J. Heinz Co. "57"	United States Government
Yale & Towne Mfg. Co.	International Har. Co.	E. I. du Pont & Co.
Cluett, Peabody & Co.	John Wanamaker	General Electric Co.
Consolidated Gas Co.	Remington Typewriter Co.	Packard Motor Car Co.
B. F. Goodrich Co.	Continental Gin Co.	Continental Can Co.
Hammermill Paper Co.	Erie Railroad Co.	American Tobacco Co.
Procter & Gamble Co.	Ohio Box Board Co.	John Morrell & Co.

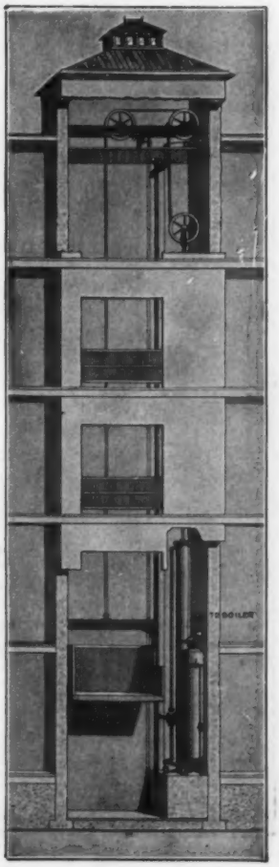
CRAIG RIDGWAY & SON CO.

Over 3,000 in daily use. **COATESVILLE, PA.**

Direct Acting



Double Geared



COX'S COMPUTER

For High-Pressure Fluid Discharge

Will save hours of tedious, brain-tiring computation and get results instantly when seeking to find the discharge from a pipe. Also to find suitable initial and Terminal Pressures.

Based on a well-known and reliable formula, which is applicable to Gas, Air and other elastic fluids, flowing through pipes with high initial pressures.

Price $5.00 *each, net, in cloth case* 6½ *x* 8 *inches*

COX'S GAS-FLOW COMPUTER

For Low Pressures

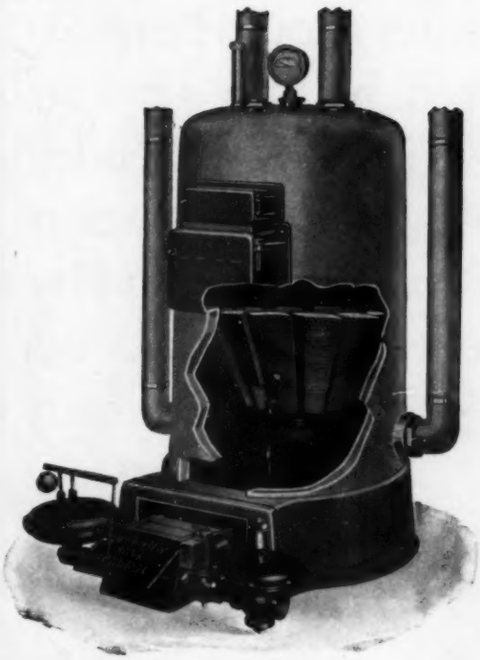
This computer solves Prof. Pole's formula for the flow of gas in pipes. All the work is done for the Engineer in making computations relative to the subject covered by the title.

Price $5.00 *each, net, in cloth case* 6½ *x* 8 *inches*

AMERICAN GAS JOURNAL

53 Park Place - - - - - New York City

Are You Sold on Your Own Product?



Most Heat per Dollar

ROBERTS CONTROLLED GAS HEATING UNIT! FOR STEAM, HOT WATER AND WARM AIR.

Are you looking towards the future of the gas industry? Have you tried heating your own home with gas? Do you recommend gas heating units to your friends?

Your profits must come from the sale of your own gas to satisfied users. The more gas you sell—the more profit you will make. But—you can not expect your customers to purchase gas heating units which will use an extravagant amount of gas. You want enthusiastic gas users.

You can recommend, you can sell, you can install the Roberts Controlled Gas Heating Units. Their superiority has been proven for manufactured gas, for natural gas, and for mixed gas. The Roberts system of automatic air control prevents an excessive amount of cold air rushing into the combustion chamber and then requiring an excessive amount of gas to heat it with. The Roberts pilot flame is absolutely safe. The Roberts venturi mixers inject a maximum amount of air as primary air. And the Roberts special radiants convert the unusually high flame temperature into highly radiant heat and direct it against the sides of the fire pot. These are only a few of the many exclusive Roberts features.

If you are interested in promoting the sale of your own product, write us on your letterhead and we will submit our sales proposition.

ROBERTS GAS BURNER CORPORATION

128 West Chippewa Street Buffalo, N. Y.

Stop *Guessing* at Water Heater Value . . . .

The value of a water heater should be measured by the kind of service it will render . . its cost of operation . . its durability and its safety rather than by its price . . . for often the lower the price, the more it costs!

Here's a way to measure it!

WATER HEATER value should be measured at the faucet—for if the heater functions properly, your customers will soon forget it and the price paid for it—remembering only the comfort and convenience it provides. But if the service is not ample and pleasing—if the monthly cost runs high—if it is not durably built, demands frequent servicing, or the danger of accident due to overheating or escaping gas is apparent—the heater is never forgotten and your customers will be quick to tell their friends of their displeasure.

So measure water heater value by the kind of service it provides—by its efficiency—its durability, and by its safety—rather than by its price. See that *your* customers get honest value. See that they get the service—efficiency—durability and safety that the Humphrey provides.

There is a type and size for every purpose and purse, from the smallest home to the largest building. Humphrey Merchandise Men will co-operate with you to the fullest extent. Ask for the new Humphrey advertising and merchandising plan.

Value . . .
. . . demands
a higher price
. . . gets
a higher price
. . . and is
well worth
the difference

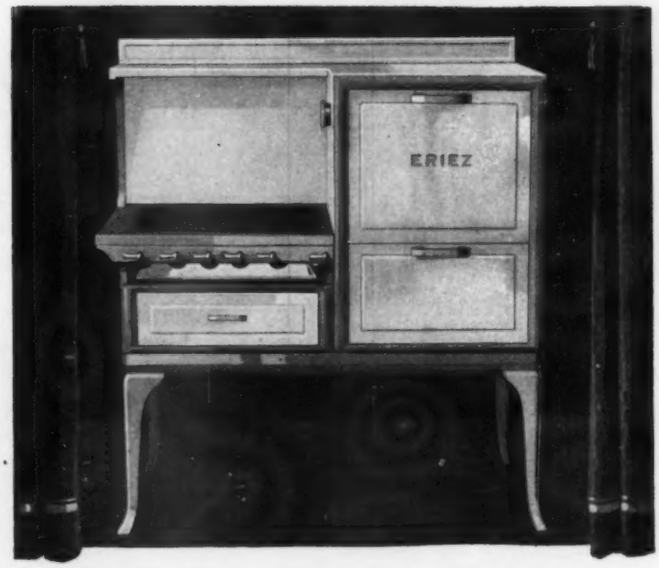
SERVICE
EFFICIENCY
DURABILITY
SAFETY

HUMPHREY
AUTOMATIC GAS WATER HEATER

HUMPHREY COMPANY DIV. RUUD MFG. CO. **KALAMAZOO, MICHIGAN**

Presenting

The Quarter Century ERIEZ



GAS RANGE

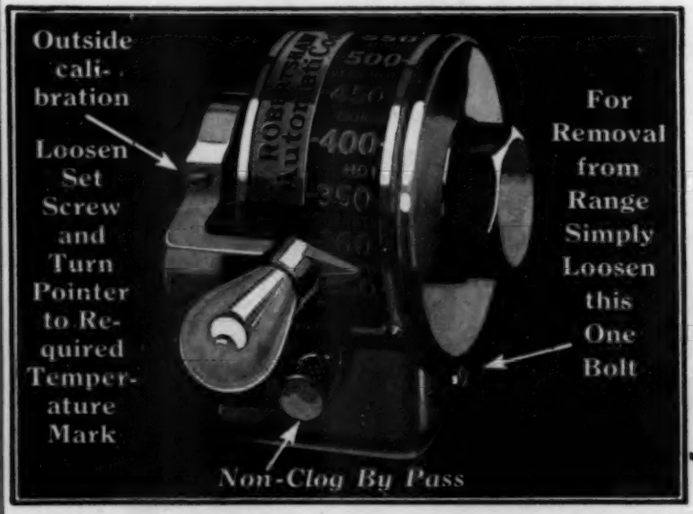
With the production of the new Quarter Century ERIEZ Gas Ranges, the ERIEZ Stove and Manufacturing Company celebrates its Silver Anniversary of Service to the gas using public. Twenty-five years of intensive study of the needs of the housewife have resulted in these remarkable new models which possess many exclusive labor saving features that assure the utmost in gas range efficiency and convenience. Modern methods of production allow a very popular price to be placed upon these models.

The Eriez Sales and Home Service Departments have developed new plans to support the sale of the Quarter Century Models. These plans lay great emphasis on effective sales from the retail floor regardless of special campaigns. We invite your investigation of the Eriez agency for your locality.

Eriez Stove and Manufacturing Company

Erie, Pennsylvania

GAS COMPANIES and STOVE DEALERS


Outside calibration
Loosen Set Screw and Turn Pointer to Required Temperature Mark
For Removal from Range Simply Loosen this One Bolt
Non-Clog By Pass

Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

HOMESTEAD FIRES
Give *Diffused* Radiation

There's a mighty big difference between direct radiation and diffused radiation.

The usual form of radiant heater casts its heat rays in a straight line, or at best, in a very shallow arc.

Homestead Coalfires and Woodfires *spread their heat rays in a broad fan-like mass* that permeates every corner of the room diffusing a glow of healthy warmth throughout the entire room area.

Added to this super heating efficiency is the feeling of hominess that truly rivals the old log fires and brazier of coals, that are always pictured and described when a cheerful atmosphere is needed to accentuate the joy and pleasure of the family hearth.

The illustration above shows how appropriately the Homestead "Woodfire" fits in with the Spanish setting. No other fire except a homestead "Coalfire" would be as as attractive as well as utilitarian.

Even when "cold" Homestead Fires possess a decorative value that is unsurpassed for natural beauty, because they are the logical adornment of the empty fireplace and fit in with any artistic motif.

It is for these reasons that the demand for Homestead Fires has grown wherever attractively displayed in appropriate settings, such as the one featured here.

Our new portfolio showing the complete line will be sent to New Business and Commercial Managers requesting same on their official stationery.

HOMESTEAD HEATER COMPANY, Inc.

Selvage Street and Fabyan Place WALTER KENNEDY, PRESIDENT **Newark, N. J., U. S. A.**

Cut Maintenance Cost

and avoid frequent shut-downs with

R & E REFRACTORY CEMENTS

R&E

Water Gas

In a 12′ Water Gas Set the lining was laid up with R & E 3000 and a wash coating of the same applied to prevent penetration and clinker adherence. After 1500 hours constant severe operation the generator was shut down for inspection. The lining was in excellent condition and the generator was again put in service for another 1500 hours. At the end of 3000 hours, R & E 3000 had established a record for severe duty far beyond any previous experience with other cements. R & E 3000 had saved a big repair charge.

R & E 3000 comes in plastic form ready for immediate use. It can safely be used for construction and patching work where temperatures do not exceed 3000° F. R & E 3000 is shipped in air-tight steel drums, 800 lbs., 500 lbs., and 100 lbs. Full directions on each drum.

Ask for booklet describing characteristics and uses of our special cements—wet or dry.

Gas Benches

Several months ago we patched a gas retort with R & E 3000, filling a hole 18″ x 42″. Several other cements had been tried on this repair job but all failed. Our patch with R & E 3000 is still there.

Coke Ovens

A large coke oven plant is using R & E 3000 to level the floors of the ovens when they become corrugated. Ask us how we did it. We'll gladly tell any coke oven superintendent.

Refractory & Engineering Corp'n.
50 Church St. New York

Western Representatives
The Gehnrich Corporation
327 So. La Salle St., Chicago

Distributors with Stock at Convenient Points

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY

1439 BRANDYWINE STREET - - - - - PHILADELPHIA, PA.

McWANE PIPE

"I Finally Got Up Enough Nerve—"

TIME after time our customers report experience that make our claims for McWane pipe sound too conservative.

"I finally got up enough nerve," a City Manager writes us, "to make my first purchase of McWane pipe." He had been listening to the Anvil Chorus.

Then when his 6-inch McWane pipe had been installed he wrote:

"I believe I am safe in saying that the cost of laying is 50% less than it could have been had we used . . . pipe, as we have heretofore."

He used genuine McWane pipe and McWane Precalked joints. How is your nerve?

WRITE FOR ILLUSTRATED LITERATURE

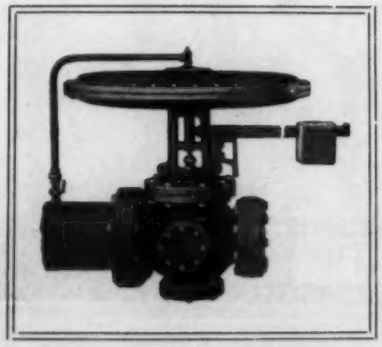
McWANE CAST IRON PIPE CO.
BIRMINGHAM, ALA.

PACIFIC STATES CAST IRON PIPE CO.
PROVO, UTAH

SALES OFFICES IN PRINCIPAL CITIES

McWANE
CAST IRON PIPE

Efficient Regulation



The Fulton
Low Pressure Regulator

Efficient regulation depends upon the accuracy of the regulation equipment. For 35 years the Chaplin-Fulton Manufacturing Company has made regulating devices for the gas industry. That the aim to make the most accurate and reliable equipment possible has been reflected in the Chaplin-Fulton series of regulators, is evidenced by their popularity and standing with the foremost gas companies.

For an investment in efficient regulation, the following Chaplin-Fulton Regulators offer you the most that can be built into devices for these purposes.

High Pressure Regulators
Low Pressure Regulators
House Regulators
Illuminating or Dead Weight House Regulators
House Service Regulators—Spring Style
High Pressure Spring Regulators
Little Hercules High Pressure Regulators
Gas-Fuel Boiler Governors
Gas Relief Valves
Duplex Sensitive Gas Governors
Back or Check Pressure Regulators

Write for information and catalogues.

The Chaplin-Fulton Mfg. Co.

28-40 Penn Ave.
Pittsburgh, Pa.

. . . to guard against freezing of

Water-Seals . .

In multiple-lift water-seal gas holders, the temperature of the seal water should be checked carefully during winter months to avoid freezing, and the resultant hindrance to holder operation.

Installation of a Bristol's Recording Thermometer having sensitive bulb inserted in the recirculating line; with flexible lead extending to the recording unit mounted in the holder station, will show the exact trend of seal temperatures at all times, and enable those in charge to maintain conditions within set limits, safe from dangerous high and low extremes.

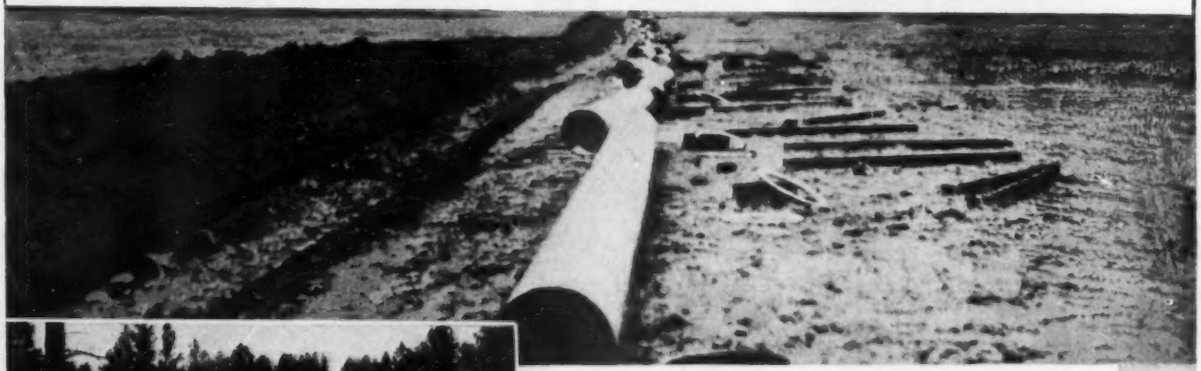
Bristol's Thermometer Thermostat Controller, can be adapted to control seal temperatures automatically.

The simple, rugged construction of Bristol's Recording Thermometers is your assurance of continuous accuracy and trouble-free operation. Write us for more complete information.

The Bristol Company

Waterbury, Connecticut

Amarillo-Denver Gas Line



An engineering conquest with "NATIONAL" PIPE

ACROSS plains, up and down mountains and steep hillsides, through deep canyons and across streams, pipe lines are being laid with much the same regularity and plan as our great railway systems. Communities heretofore unserved are now economically and efficiently supplied with these useful and convenient products.

But such projects carry a heavy responsibility. Investments running into millions of dollars must be safeguarded with materials that give every promise of long and faithful service—there can be no compromise with quality.

Here, another engineering conquest has been completed, another link in the network of great pipe lines which spread across the continent. The main line of this project contains over 300 miles of 20 and 22-inch "NATIONAL" Pipe—The Recognized Standard for Manufactured and Natural Gas Service.

NATIONAL TUBE COMPANY
Pittsburgh, Pennsylvania
Subsidiary of United States Steel Corporation

To The Industrial Sales Manager:-

THE American Gas Association stresses the necessity of improving the efficiency of existing industrial gas installations to meet increasing competition.

The installation of the

IMPROVED KEMP SYSTEM

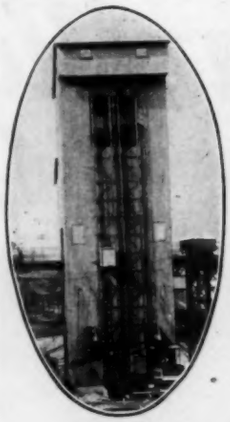
on a performance basis is often the answer to this problem.

May we tell you about it?

Write, 'phone or telegraph.

The C.M. KEMP Mfg. Co.

Baltimore, Md.



HUNT
SKIP HOISTS

For elevating Coal, Ashes and Coke in Gas Plants.

Made in Vertical or Inclined Types.

A full description of the various types, with complete engineering data showing adaptability of the Hunt Skip Hoist to the hoisting of coal, coke and ashes, with suggestions to the engineer, draftsman and operating man, is contained in our new Catalog 27-1. Send for it.

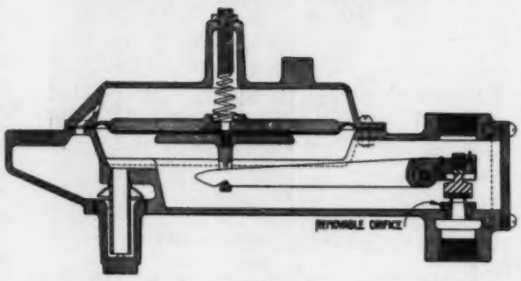
WE DESIGN AND BUILD:

Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope, and the "Flotograv" (Coke Reclamation System).

C. W. HUNT CO. Inc.
WEST NEW BRIGHTON,
STATEN ISLAND, N. Y.
Chicago - Montreal - Boston

HUNT

GROBLE
REGULATORS & GOVERNORS



CONSIDER GROBLE FEATURES

Accessible and removable valve.
Removable orifice.
Simplicity of repairs in service.
Sealing 10 inches of pressure with one ounce of mercury.
Positive lock-off with one inch additional pressure.

GROBLE GAS REGULATOR COMPANY
Anderson, Indiana

Representatives
Utilities Service Co., Peoples Gas Building, Chicago.
H. E. Broughton, 404 Donovan Building, Detroit.
The Worrall Co., 472 Central Ave., East Orange, N. J.
Midland Supply Co., Dwight Bldg., Kansas City, Mo.
Seidenglanz & Co., Second Unit, Santa Fe Bldg., Dallas.
Fagan-Andrews Co., 135 Michigan St., Milwaukee

Perfect Welded Joints

The present tendency in pipe line construction is toward oxy-acetylene and electric welding of joints. The question arises—"What kind of pipe welds best?"

Due to the tough, dense, forged grain structure of Pittsburgh Seamless Pipe and its uniform flawless quality it is giving complete satisfaction for acetylene joint-welding.

Pittsburgh Seamless Pipe has no weak spots—no welded seams to give trouble. It is a full one-third stronger than lap-weld pipe of equal dimensions. The high operating pressures made possible by this greater strength tell a real story of efficiency.

And to its advantages in operating efficiency add economy in laying the line; extra long lengths (up to 45 feet) mean lower costs for construction and maintenance. Let us quote on your next line.

Lengths up to 45 Feet
Sizes up to 13⅜" O. D.

Pittsburgh Seamless *Is Safe*

Pittsburgh Steel Products Co.

DIVISION OF

Pittsburgh Steel Co.

DETROIT · CHICAGO · NEW YORK · PITTSBURGH · HOUSTON · TULSA

AMERICAN Gas Maker's Gauge

The new American Gas Maker's Gauge is constructed so that there is perfect protection against loss of calibration due to accidental overloading. And in case of excess pressure, this gauge cannot be injured.

The full arc scale of 280°, with the subdivisions evenly graduated, shows the slightest fluctuation in single inches of water pressure.

Made in black enameled case and ring with either bottom or back connection. The dial sizes are 4½", 6", and 10". The standard ranges, in inches of water pressure, are: 0-20, 0-30, 0-60, 0-100 and 0-150.

Write for these Catalogs

Gas Maker's Gauge	P-7
Recording Thermometer	H-7
Temperature Controller	R-7
Recording Gauge	E-7
Glass Thermometer	F-7

CONSOLIDATED ASHCROFT HANCOCK CO. INC.
Subsidiary of Manning, Maxwell and Moore, Inc.
100 East 42nd Street, New York City

Clark Industrial Burner Tips

(Patented)

These tips for low pressure fan blast systems will outlast the life of metal tips many times.

Made in 15, 30, and 45 cubic foot capacities, to fit respectively ¾", 1", and 1¼" standard reducing couplings.

These tips lend themselves to a wide variety of industrial burner applications. Further information will be gladly supplied on request.

American Lava Corporation
29-59 William St. Chattanooga, Tenn.
Manufacturers of Lava Tips & Heat Resistant Insulators

RITER-CONLEY CO.
STEEL CONSTRUCTION
PITTSBURGH

STEEL PLATEWORK
FOR
THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
Purifiers

BRANCH OFFICES

New York — Boston — Baltimore
Chicago — Philadelphia — Detroit
Cleveland — Cincinnati — Seattle
San Francisco — Los Angeles

THE BABY DIGGER

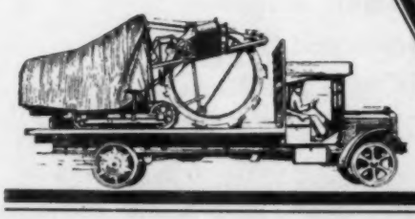
YOUR HANDYMAN IN GAS DISTRIBUTION

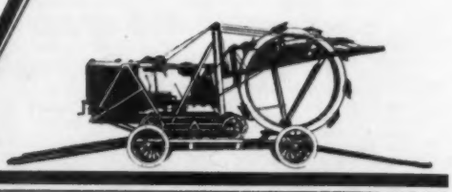
THE Baby Digger is indeed a "handyman" for all gas trench digging. Light and compact, yet sturdily built and powerful, this little trencher delivers a maximum trench footage in the hardest and toughest of soils. It operates easily in narrow alleys, in parkways, close to trees and poles and between sidewalks and curbs as well as in the open areas.

Weighing only four tons it is easily and quickly moved from location to location. In five minutes you can load or unload it on its own trailer or a truck, thus making it available for use on even your relatively small jobs. In fact, it is a most usable, most practical, most economical trencher. An extremely handy machine that eliminates most of your hand labor, enabling you to get maximum distribution at minimum cost.

Gas Companies, in all parts of the country have found in these handy, efficient little trenchers the final solution to their digging problems. Write today for full information.

THE CLEVELAND TRENCHER CO.
20100 St. Clair Ave.
CLEVELAND
OHIO





PIONEERS OF THE SMALL TRENCHER

Buyers' Reference Index

See page 129 for advertisements of these products

A. B. C. SELF CLINKERING GRATES
The Western Gas Construction Company.

ACCUMULATORS—STEAM
The Gas Machinery Co.
Ruth's Steam Accumulator Co.
A. O. Smith Corp.
Smoot Engineering Corp.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

ACETYLENE EQUIPMENT
American Lava Corp.
Alexander Milburn Co.
Union Carbide & Carbon Co.

ACCOUNTING MACHINES
Remington Rand, Inc.

AIR FILTERS
Staynew Filter Corp.

AMMONIA CONCENTRATORS
Bartlett Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA CONCENTRATED LIQUOR PLANTS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

AMMONIA PIPE
National Tube Company.

AMMONIA RECOVERY APPARATUS
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA TEST
American Meter Co.

APPRAISALS & INVENTORIES
Stacey Bros. Gas Construction Co.
United Engineers & Constructors, Inc.

APPARATUS
Laboratory Experimental
American Meter Co.
Service
American Meter Co.

ASH STORAGE BINS
C. W. Hunt Co., Inc.
Semet-Solvay Engineering Corp.
Riter-Conley Co.
The Stacey Mfg. Co.

AUDITS
United Engineers & Constructors, Inc.

AUTOMATIC CONTROLS FOR WATER GAS APP.
United Engineers & Constructors, Inc.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BACK PRESSURE VALVES
Connelly Iron Sponge & Governor Co.

BACKRUN GAS EQUIPMENT
Semet-Solvay Engineering Corp.

BAGS
Safety Gas Main Stopper Co.

BAROMETERS
Connelly Iron Sponge & Governor Co.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

BELTS
Conveyor and Elevator.
Robins Conveying Belt Co.

BENCHES
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Gas Machinery Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BENZOL
Bartlett-Hayward Co.
Carl Still, Inc.
The Koppers Construction Co.

BENZOL RECOVERY PLANTS
Semet-Solvay Engineering Corp.

BLOWERS
Industrial Burner
Connersville Blower Co.
Revivifying
Connersville Blower Co.
Water Gas Set
Connersville Blower Co.

BLOWERS & BOOSTERS
Gas Engineering Co.
The Gas Machinery Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BLUE GAS PLANT
Bartlett-Hayward Co.
Carl Still, Inc.
Gas Engineering Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

BOOKKEEPING MACHINES
Remington Rand, Inc.

BOOSTERS
American Brown.
Boveri Elec. Corp.
Connelly Iron Sponge & Governor Co.
Connersville Blower Co.

BRICK
Fire and Checker
Botfield Refractories Co.
The Gas Machinery Co.
Improved Equipment Co.-Russell Eng. Corp.
United Engineers & Constructors, Inc.
United States Refractories Corp.
Silica
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Company.
United States Refractories Corp.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
Alpha-Lux Co.

BUILDINGS
United Engineers & Constructors, Inc.

BURNERS (Industrial)
American Lava Corp.
The C. M. Kemp Mfg. Co.
Conversion
Cleveland Gas Burner & Appliance Co.
Conversion House Heating
Roberts Gas Burner Corp.
Fuel
Cleveland Gas Burner & Appliance Co.

BY-PRODUCT COKE
Semet-Solvay Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Carl Still, Inc.
The Gas Machinery Co.
International Coal Carbonization Co.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
West Gas Improvement Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.

Alpha-Lux Company.
American Meter Co.
Consolidated Ashcroft Hancock Inc., Co.

CALORIMETERS
John J. Griffin & Company.

CALORIMETER ACCESSORIES
American Meter Co.

CARBONIZATION
The Gas Machinery Co.
Low Temperature
International Coal Carbonization Co.

CARBURETTED WATER GAS
The Western Gas Construction Co.

CARBURETTED WATER GAS PLANTS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

CARS
C. W. Hunt Co., Inc.

CASINGS, SEAMLESS STEEL
National Tube Co.

CAST IRON PIPE
Bell
Cast Iron Pipe Research Ass'n.
Spigot
Cast Iron Pipe Research Ass'n.

CEMENTS
The Jersey City Refractories Co., Inc.
Quigley Furnace Spec. Co., Inc.
Acid-proof
Botfield Refractories Company.
Quigley Furnace Spec. Co., Inc.
Firebrick
Botfield Refractories Company.
Improved Equipment-Russell Engineering Corp.
United States Refractories Corp.
High Temperature
Alpha-Lux Company.
Botfield Refractories Company.
E. J. Lavino & Co.
Quigley Furnace Spec. Co., Inc.
United States Refractories Corp.
Refractory
Botfield Refractories Company.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Co.
Refractory Engineering Corp.
United States Refractories Corp.

CHAMBER OVENS
United Engineers & Constructors, Inc.

CHARGING MACHINERY
Bartlett-Hayward Co.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

CHUTES
Eaton-Kent, Inc.
C. W. Hunt Co., Inc.
Riter-Conley Company.
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

CLAMPS (PIPE)
S. R. Dresser Mfg. Co.

CLOCKS & WATCHES, Stop
American Meter Co.

COALS
Pittsburgh Coal Co.
Westmoreland Coal Co

COAL GAS APPARATUS
Bartlett-Hayward Co.
Carl Still, Inc.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Company.
The Western Gas Construction Company.

COAL & COKE BINS CASTINGS
The Koppers Construction Co.
The Stacey Mfg. Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Dry Quenching Equipment Corp.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.

COAL TAR PRODUCTS
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COAL TUBES
C. W. Hunt Co., Inc.
Meter
American Meter Co.
Superior Meter Co.
Service
American Meter Co.

COKE CRUSHERS
The Koppers Construction Co.
Robins Conveying Belt Co.

COKE QUENCHING
Dry Quenching Equipment Corp.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COKE RECLAMATION SYSTEMS
C. W. Hunt Co., Inc.

COMPUTERS
Heating Value
United Engineers & Constructors, Inc.

CONDENSERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.
High Duty
Stacey Bros. Gas Const. Co.
United Engineers & Constructors, Inc.

CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

CONTROLS
The Bristol Company.
The Brown Instrument Co.
Robertshaw Thermostat Co.
Combustion
Smoot Engineering Corp.
Gas Pressure
Smoot Engineering Corp.
Gas Producer
Smoot Engineering Corp.
Hot Water Heat System
The Cleveland Heater Company.
Water Gas Machine
Smoot Engineering Corp.

CONVEYORS
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Robins Conveying Belt Co.

CONCENTRATORS, AMMONIA
(See Ammonia Concentrators.)

COOLERS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.
Air
Andale Company.
Ammonia Liquor
Andale Company.
Gas
Andale Company.
Oil
Andale Company.

COOLING COILS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction **Company.**

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
National Tube Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Victaulic Co. of Amer.

a book on the TWO-MAIN SYSTEM

free to city officials, engineers, and taxpayers

"The Two-Main System" gives all the facts and figures about today's way to lay gas or water pipes. It explains in detail why property owners will soon be demanding a modern system which guarantees that costly streets, once laid, will never be torn up for pipe laying, replacement, extensions, or repairs. It explains how the Two-Main System meets this demand, in many cases at less than the cost of the one-main system. Every forward-looking municipal official, city planner, and engineer should read "The Two-Main System" and file it for reference. It is a handy pocket-size little volume written in readable non-technical style. It is fully illustrated with photographs, charts, and drawings. It is mailed free of charge by The Cast Iron Pipe Research Association, Peoples Gas Bldg., Chicago, Ill. Address: Thos. F. Wolfe, Research Engineer.

CAST IRON PIPE

Buyers' Reference Index

See page 129 for advertisements of these products

COUPLINGS—FLEXIBLE
The P. H. & F. M. Roots Company.

CUTTING APPARATUS & SUPPLIES
Alex and Milburn Co..
Union Carbide & Carbon Co.

CRUSHERS
Riter-Conley Company.

CUBIC FOOT BOTTLES
American Meter Co.
Lambert Meter Co.

DE-EMULSIFIERS
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

DEHYDRATORS, GAS
Andale Company.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.
The Western Gas Construction Company.

DEMONSTRATION METERS
Lambert Meter Co.

DIAPHRAGMS
Lambert Meter Co.
(Meter)
American Meter Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.

DRAFT GAUGES
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
C. W. Hunt Co., Inc.
Craig Ridgway & Son Co.
Robins Conveying Belt Co.

ENGINE INDICATORS
Consolidated Ashcroft Hancock Co., Inc.

ENGINEERS
American Meter Co.
The Gas Machinery Co.
Combustion
Bartlett-Hayward Co.
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.
United Engineers & Constructors, Inc.
Consulting
Bartlett-Hayward Co.
United Engineers & Constructors, Inc.
George H. Waring.
The Western Gas Construction Company.
Contracting
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Company.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
Riter-Conley Company.
Stacey Gros. Gas Const. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.
Distribution
United Engineers & Constructors, Inc.
Measurement
American Meter Co.

EXHAUSTERS
Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Company.
The P. H. & F. M. Roots Company.
The Western Gas Construction Company.

EXPANSION BENDS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

FILES (Steel and Wood)
Remington Rand, Inc.

FILES (Visible)
Remington Rand, Inc.

FILTERS, Gas
American Meter Co.

FIREBRICK, CEMENT
Quigley Furnace Specialties Co., Inc.

FIREBRICK CHECKER BRICK
(See Brick)
Botfield Refractories Company.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FIRST AID EQUIPMENT
United Engineers & Constructors, Inc.

FITTINGS
James B. Clow & Sons.
Isbell-Porter Company.
Kitson Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe and Foundry Co.
The Western Gas Construction Company.
Plain End and Flanged
Cast Iron Pipe Research Association.

FIXTURES
American Lava Corp.
General Gas Light Co.

FLOORS, IRON, BRICK, AND STEEL
The Gas Machinery Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FLOW METERS
Brown Instrument Co., The
Lambert Meter Co.

FLUE PIPE (Cast Iron Oval)
James B. Clow & Sons.
Semet-Solvay Engineering Corp.

FURNACES
James B. Clow & Sons.
Gas Fired
The C. M. Kemp Mfg. Co.
Gas Soldering
American Meter Co.

GAS ANALYSIS APPARATUS
Metric Metal Works.

GASKETS
American Meter Co.
Consolidated Ashcroft Hancock Co., Inc.
Pittsburgh Equitable Meter Co.

GAS COAL
Pittsburgh Coal Co.
Westmoreland Coal Co.

GASOMETERS (Test)
American Meter Co.

GAS PLANTS, COMPLETE
Carl Still, Inc.
Gas Engineering Co.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.

GASSING MACHINE
American Meter Co.
Lambert Meter Co.

GAS TAPE
Connelly Iron Sponge & Governor Co.

GAS TESTING APPARATUS
Metric Metal Works.

GATE VALVES (See Valves)

GATES—WIND & BLAST
The P. H. & F. M. Roots Company.

GAUGE BOARDS
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

GAUGES
American Meter Co.
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
Maryland Meter Co.
Metric Metal Works.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Taylor Instrument Companies.
The Western Gas Construction Company.
Mercury
Precision Thermometer & Instrument Company.
Pressure-Recording
Consolidated Ashcroft Hancock Co., Inc.
D. McDonald & Co.
Precision Thermometer & Instrument Company.
Siphon
Precision Thermometer & Instrument Company.
Tank
Precision Thermometer & Instrument Company.
Water
Precision Thermometer & Instrument Company.

GENERATORS, Oxygen & Acetylene
Alexander Milburn Co.

GLOVES
Rubber
Safety Gas Main Stopper Co.

GOVERNORS
Pittsburgh Equitable Meter Co.
Automatic
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.

GOVERNORS (Calorimeter and Double Dry)
American Meter Co.
Coke Oven
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
District
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Helme & McIlhenny.
Isbell-Porter Co.
Smoot Engineering Corp.
Exhauster
Connelly Iron Sponge & Governor Co.
Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Co.
The P. H. & F. M. Roots Company.
Smoot Engineering Corp.
High Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
American Meter Co.
Connelly Iron Sponge & Governor Co.
Lambert Meter Co.
D. McDonald & Co.
Reynolds Gas Regulator Co.
Low Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Lambert Meter Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Isbell-Porter Company.
Station
Helme & McIlhenny.

GRATES for Water Gas Generators
Semet-Solvay Engineering Corp.

GRAVITOMETERS
Precision Thermometer & Instrument Company.

GRIDS, for Scrubbers
Semet-Solvay Engineering Corp.

HEATERS
James B. Clow & Sons.
Feed Water
Andale Company.
House
American Gas Products Corp.
Cleveland Gas Burner & Appliance Co.
The Cleveland Heater Company.
Roberts Gas Burner Corp.
Room
American Gas Products Corp.
American Stove Company.
General Gas Light Co.
Homestead Heater Company.
Welsbach Company.
Water
The Cleveland Heater Company.
Humphrey Company.
Ruud Mfg. Co.
Kompak Company.
Welsbach Company.
Pittsburg Water Heater Co.

HIGH CAPACITY METERS
Lambert Meter Co.

HIGH PRESSURE PIPE LINES
The Western Gas Construction Company.

HOISTS
The Gas Machinery Co.
C. W. Hunt Co., Inc.
Robins Conveying Belt Co.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Company.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.

HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
Riter-Conley Company.
Robins Conveying Belt Co.
The Stacey Mfg. Co.

HOTELS
Shelburne Hotel.

HOWARD AUTOMATIC CHARGERS
The Western Gas Construction Company.

HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

HYDROGEN SULPHITE TEST (Apparatus)
American Meter Co.

HYDROMETERS
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

INCINERATORS, GAS-FIRED
Kernit Incinerator Co.

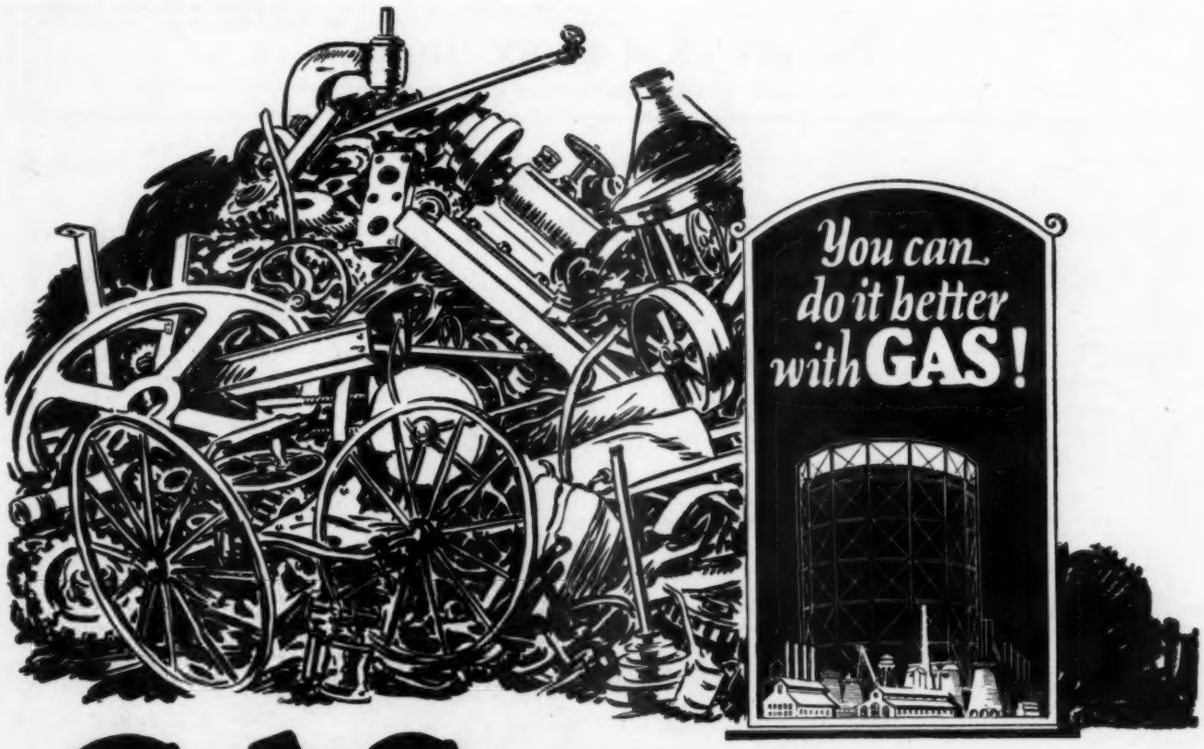
INDUSTRIAL GAS MIXERS
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Corp.
Smoot Engineering Corp.

INDUSTRIAL TRACK
C. W. Hunt Co., Inc.

IRON BORING OXIDE
Gas Purifying Materials Co., Inc.

IRON SPONGE
Connelly Iron Sponge & Governor Co.

INSTRUMENTS
Alpha-Lux Company.
The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Lambert Meter Co.
Metric Metal Works.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.
Recording
American Meter Co.



GAS in Industry

modernizes time-worn methods

It is surprising how the application of gas in industry sometimes brings about complete changes in time-worn methods. . . .

An example (which may have its counterpart in your own plant) is found in varnish making. Varnish must be heated to a definite pre-determined temperature, and removed from the heat at the precise, critical moment. Failure to observe these requirements means that the entire kettle of varnish is spoiled.

Since the industry's origin, varnish kettles have always been mounted on wheels to facilitate quick removal from the fire. But gas today is changing all that. Gas can be turned off more quickly than it would be possible to wheel the kettle away!

Positive temperature control, made possible by gas, insures better varnish. Manpower is conserved through the use of gas. And the danger of fire—ever present by the old method—is averted.

. . . . Now consider gas for *your own* plant. Gas may or may not affect your production in these precise ways. But gas *does* hold very definite, very valuable potential advantages for you. . . . and you should know what these advantages are. Your local gas company will gladly tell you about them. Write or telephone them today.

For free copy of book, "Industrial Gas Heat", address

American Gas Association
420 Lexington Avenue, New York City

Buyers' Reference Index

See page 129 for advertisements of these products

JOINTS (Pipe)
S. R. Dresser Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
United Engineers & Constructors, Inc.
Victaulic Co. of Amer.

JOINT RUNNERS
Safety Gas Main Stopper Co.

LAMPS
General Gas Light Co.

LAMP POSTS
General Gas Light Co.

LAVA BURNER GRIDS
American Lava Corp.

LAVA PILOT TIPS
American Lava Corp.

LINING—REFRACTORY
(See Refractory Linings

LOCKERS
Remington Rand Co.

LOOSE LEAF EQUIPMENT
Remington Rand Co.

LUX MATERIAL
Alpha-Lux Company.

LUX SPONGE
Alpha-Lux Company.

MANILA AND WIRE ROPE
C. W. Hunt Co., Inc.

MANOMETERS
Brown Instrument Co., The
Precision Thermometer & Instrument Company.

MANTLES
General Gas Light Co.
Welsbach Company.

MASKS—GAS
Safety Gas Main Stopper Co.

MAST & GAFF OUTFITS
C. W. Hunt Co., Inc.

MEASURING CHUTES
C. W. Hunt Co., Inc.

MECHANICAL GENERATORS for Water Gas App.
United Engineers & Constructors, Inc.

METER CONNECTIONS
American Meter Co.
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
Lambert Meter Co.
D. McDonald & Co.
Maryland Meter Works.
Pittsburgh Equitable Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.

METER REPAIRING
Lambert Meter Co.

METER TESTER, Hydro-Pneumatic
American Meter Co.

METERS
Brown Instrument Co., The
Pittsburgh Equitable Meter Co.
Air
American Meter Co.
Connersville Blower Co.
The Gas Machinery Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.
Artificial
American Meter Co.
Connersville Blower Co.
Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
Neptune Meter Company.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Nathaniel Tufts Meter Works.
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Connersville Blower Co.
John J. Griffin & Company.
Lambert Meter Co.
D. McDonald & Co.
The P. H. & F. M. Roots Company.
Superior Meter Co.
Demonstration
American Meter Co.
Dry
American Meter Co.
John J. Griffin & Company.
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D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Exhibition
American Meter Co.
Natural Gas
American Meter Co.
Connersville Blower Co.
John J. Griffin & Company.
Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Meter Works.
The P. H. & F. M. Roots Company.
The Sprague Meter Co.
Superior Meter Co.
Oil
American Meter Co.
Connersville Blower Co.
The Gas Machinery Co.
Orifice
American Meter Co.
Positive
The Sprague Meter Co.
Prepayment
American Meter Co.
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D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Proportional
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Connersville Blower Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
Nathaniel Tufts Meter Works.
The Western Gas Construction Company.
Steam
American Meter Co.
The Gas Machinery Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.
Test
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Wet Test
American Meter Co.

MILLER GRIP PACKING
Connelly Iron Sponge & Governor Co.

MIXERS, GAS
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Corp.
Semet-Solvay Engineering Corp.
Smoot Engineering Corp.

MOISTURE DETERMINATORS
United Engineers & Constructors, Inc.

MOTOR CARS
C. W. Hunt Co .,Inc.

NAPHTHALENE EXTRACTORS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

OFFICE FURNITURE
Remington Rand, Inc.

ORE, CHROME
E. J. Lavino & Co.

OVEN SHELF; SAFETY
Wm. Parke, Inc.

OVENS—COKE AND GAS
Carl Still, Inc.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

OXIDE
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co., Inc.
E. J. Lavino & Co.

OXYGEN AND HYDROGEN METERS
Lambert Meter Co.

PACKING
Asbestos
Safety Gas Main Stopper Co.

PAINTS
Aluminum Co. of America.
Safety Gas Main Stopper Co.
The Stacey Mfg. Co.
Wailes Dove-Hermiston Corp.
Metal Protective
Aluminum Co. of America.
Semet-Solvay Co.

PAINTS, ANTI ACID AND ALKALI
Aluminum Co. of America.
Quigley Furnace Spec. Co., Inc.

PAINTS, RUSTPROOF
Aluminum Co. of America.
Quigley Furnace Spec. Co., Inc.

PHOTOMETERS
Connelly Iron Sponge & Governor Co.

PIPE
National Tube Co.
The Stacey Mfg. Co.
Bell
American Meter Co.
Semet-Solvay Engineering Corp.
McWane Cast Iron Pipe Co.
Bell and Spigot
U. S. Cast Iron Pipe & Foundry Co.
Cast Iron
James B. Clow & Sons.
McWane Cast Iron Pipe Co.
U. S. Cast Iron Pipe & Foundry Co.
Flange
James B. Clow & Sons.
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Screw Joint Cast Iron Pipe
McWane Cast Iron Pipe Co.
Seamless Steel
Pittsburgh Steel Products Co.
Spigot
James B. Clow & Sons.
McWane Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Steel
Bartlett-Hayward Co.
James B. Clow & Sons.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Pittsburgh Steel Products Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Welded Steel
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.

PIPE COATINGS
Wailes Dove-Hermiston Corp.

PLANTS—GAS, COMPLETE
The Gas Machinery Co.
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United Engineers & Constructors, Inc.
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Maryland Meter Works

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Botfield Refractories Company
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Refractory & Engineering Corp.
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Botfield Refractories Company
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Botfield Refractories Company
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Quigley Furnace Spec. Co. Inc.
United Engineers & Constructors Inc.
The Western Gas Construction Company
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Connersville Blower Co.
Connelly Iron Sponge & Governor Co.
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Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
Smoot Engineering Corp.
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Smoot Engineering Corp.
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Smoot Engineering Corp.
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Smoot Engineering Corp.
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Botfield Refractories Company
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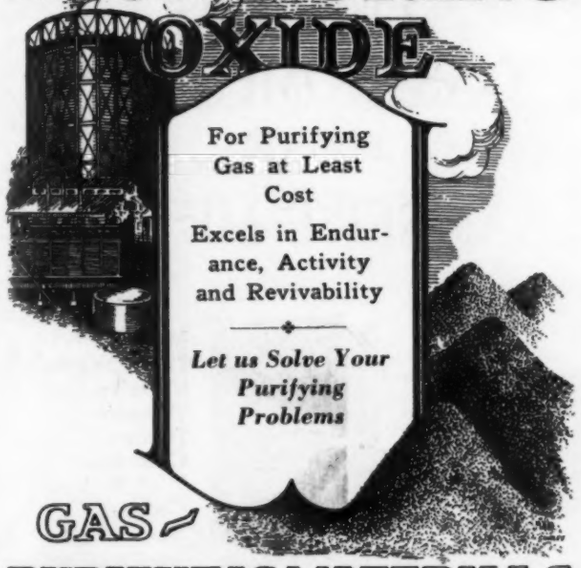

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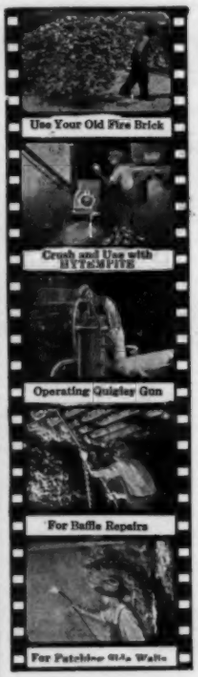

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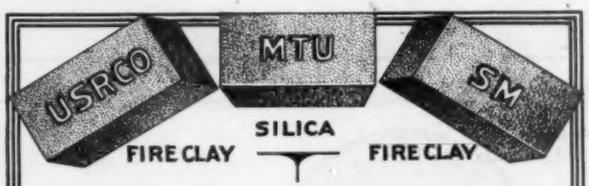

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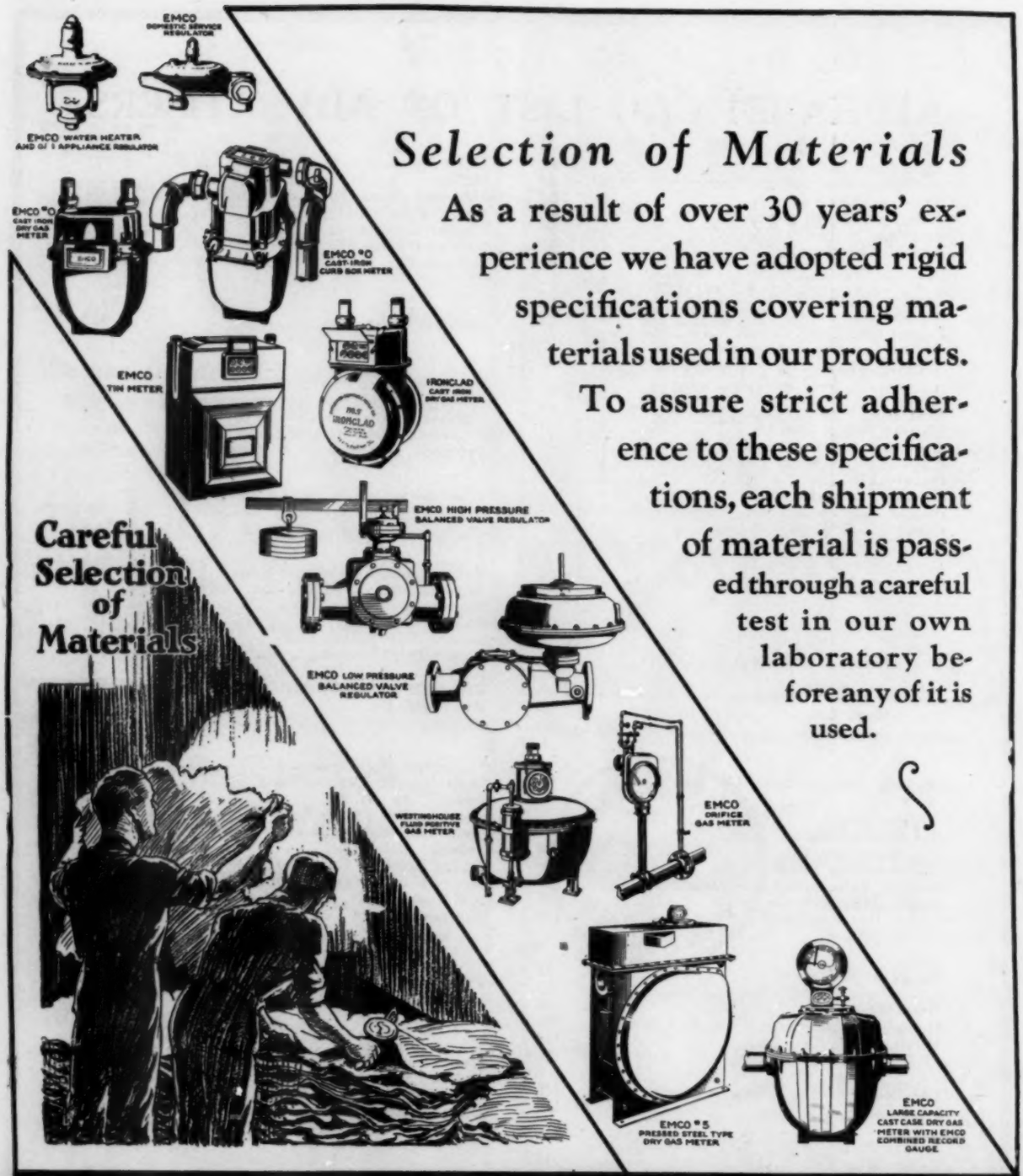
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EMCO "5" PRESSED STEEL TYPE DRY GAS METER
EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE
Careful Selection of Materials

Selection of Materials

As a result of over 30 years' experience we have adopted rigid specifications covering materials used in our products. To assure strict adherence to these specifications, each shipment of material is passed through a careful test in our own laboratory before any of it is used.

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS
TULSA SEATTLE KANSAS CITY SALT LAKE CITY

PROOF

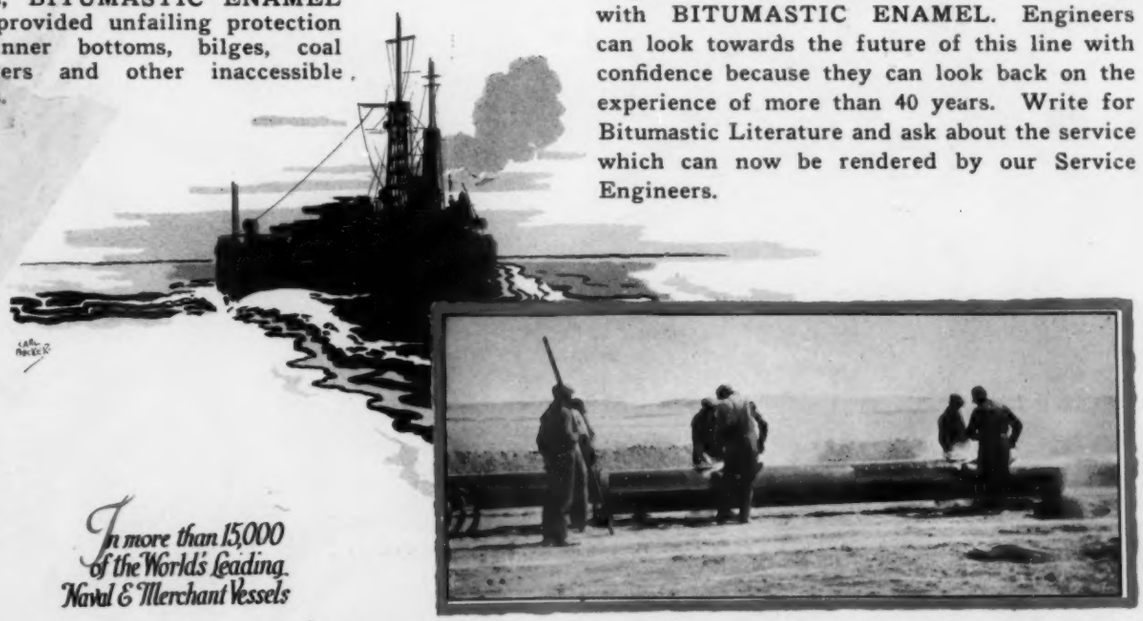
PROVEN PROTECTION FOR PIPE LINES

The Amarillo-Denver Line

There has never been a greater need for PROVEN merit than in connection with the coatings used on pipe lines. Engineers must *know* what will happen to these coatings over a long period of time and under the most corrosive conditions. There is, therefore, a true guarantee in the knowledge that, ever since the introduction of steel ships, BITUMASTIC ENAMEL has provided unfailing protection in inner bottoms, bilges, coal bunkers and other inaccessible parts.

The conditions on a pipe line buried underground, of course, do not parallel conditions on a ship. But, from the standpoint of corrosion, conditions in the bilges of a ship are *actually* far worse than on a pipe line and the unfailing performance of BITUMASTIC ENAMEL under these highly adverse conditions has led to its adoption for protection of the largest gas and oil lines in the world.

The Amarillo-Denver Line—a 22" and 20" gas pipe extending for 340 miles between Amarillo, Texas, and Denver, Colorado—is but one of the large lines that have been protected extensively with BITUMASTIC ENAMEL. Engineers can look towards the future of this line with confidence because they can look back on the experience of more than 40 years. Write for Bitumastic Literature and ask about the service which can now be rendered by our Service Engineers.



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Protects and lubricates the worm and gear

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Eliminates possible breakage in transit

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5 **Bronze Bushed Links**
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6 **Improved Adjusting Tools**
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BRIDGEPORT, CONN.